DOCUMENT RESUME

ED 133 337 TM 005 622

AUTHOR Niedermeyer, Fred C., Ed.
TITLE Prototype Testing in Instructional Development. SWRL Working Papers: 1972.
INSTITUTION Southwest Regional Laboratory for Educational Research and Development, Los Alamitos, Calif.
PUB DATE 72
NOTE 196p.

EDRS PRICE MF-$0.83 HC-$10.03 Plus Postage.
DESCRIPTORS Composition Skills (Literary); Drama; *Formative Evaluation; Handwriting Skills; *Instructional Materials; *Material Development; Methods; Primary Education; Spelling Instruction
IDENTIFIERS *Prototype Testing

ABSTRACT

When properly implemented, prototype testing appears to provide one of the most direct and economical methods for identifying means to optimize the effectiveness of a product, and ultimately to validate a product's effect. The nine papers in this volume exemplify several categories of protytype testing conducted at different stages of the development process, under different conditions, and yielding different types of results. The first two working papers describe the use of status testing in selecting and sequencing outcomes and related content for spelling and composition skills instruction. The third paper describes an experimental investigation of the effect of two manipulated variables--tracing prompts and descrimination training--on kindergarten handwriting performance. At this stage of development, prototype testing can aid in important decisions about product specifications and in avoiding costly modifications later in development. As explained in papers four and five, using prototype testing in composition skills and drama, pupil performance data are of secondary interest at such early stages in development. The sixth paper suggests certain procedures for reporting classroom observation of a program lesson and illustrates these procedures with respect to programs in composition and drama. (RC)

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ED 043337

SWRL EDUCATIONAL RESEARCH AND DEVELOPMENT

U.S. DEPARTMENT OF HEALTH,
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NATIONAL INSTITUTE OF
EDUCATION

TM005 622

PROTOTYPE TESTING IN INSTRUCTIONAL DEVELOPMENT

SWRL Working Papers: 1972

2

1972 SWRL WORKING PAPERS

COMPUTER-BASED SYSTEMS TO FACILITATE INSTRUCTIONAL DEVELOPMENT

Joseph F. Follettie and Frank Teplitzky, editors

DESIGN OF AN INSTRUCTIONAL MANAGEMENT SYSTEM

John F. McManus, editor

THE INTEGRATION OF CONTENT, TASK, AND SKILLS ANALYSIS TECHNIQUES IN INSTRUCTIONAL DESIGN

David W. Bessemer and Edward L. Smith, editors

PROTOTYPE TESTING IN INSTRUCTIONAL DEVELOPMENT

Fred C. Niedermeyer, editor

PROTOTYPE TESTING IN INSTRUCTIONAL DEVELOPMENT

Edited by Fred C. Niedermeyer

SWRL EDUCATIONAL RESEARCH AND DEVELOPMENT
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PREFACE

The documentation of large-scale development endeavors in education is a phenomenon with which the educational R&D community has had modest experience, since there has been little large-scale development to document. SWRL documentation experience confirms the applicability of Derek Price's conclusion regarding the literature of research and the literature of development.

> A scholarly publication is not a piece of information but an expression of the state of a scholar or a group of scholars of a particular time. We do not, contrary to superstition, publish a fact, a theory, or a finding, but some complex of these . . . . If the paper is an expression of a person or several persons working at the research front, we can tell something about the relations among the people from the papers themselves . . . . It seems that technologists differ markedly from both scientific and nonscientific scholars. They have a quite different scheme of social relationships, are differently motivated, and display different personality traits [Price, 1970, pp. 7-9].

> Clearly, the published paper is not, in general, the end product of a worker in a technological subject; he appears to be instead concerned chiefly with the production of an artifact or process. What then is the role of literature in technology? I suggest that for the most part it is produced as an epiphenomenon. It comes about because many technologists have had scientific training and know full well the code of behavior of the scientist in which publication is not merely right and proper, but a high duty and a behavior expected by peers and employers . . . . In general new technology will flow from old technology rather than from any interaction there might be between the analogous but separate structures of science and technology [Price, 1965, pp. 560-561].

SWRL experience has been that the course of a well-managed development effort produces considerable documentation but that a good deal of the substance of the information exceeds structures and strictures of journal publication. The journal article constitutes an available medium, but the laundering of the information required to use the medium often washes out the message.

SWRL has found it unproductive to treat information and documentation in the abstract as a "communication problem." A more useful approach is to consider operational means of making information pertinent to large-scale development in education conveniently available to interested audiences. This perspective directs attention to specifying interested audiences and devising communication compatible with their need-to-know characteristics. SWRL information architecture recognizes several audiences.

Staff involved in the development per se and the contract sponsor are two of the most immediate audiences addressed by SWRL documentation. Communication relevant to these audiences is handled by SWRL Technical Notes and Technical Memoranda that chronicle the course of SWRL R&D. These documents range in length from a few to a few hundred pages depending upon their nature. Some 200 of these Technical Notes and Technical Memoranda are issued during the course of a year--a stack several feet tall.

A third audience is the invisible colleges in which SWRL staff actively participate. Collegial exchange of selected Technical Notes and Technical Memoranda serve this audience adequately.

Another audience is product users. A volume of product working papers that brings together the documents associated with the development of each product is issued at the time the product is made available for general use and provides relevant information for this audience.

This leaves the general audience of students, scholars, and other members of the R&D community in education. SWRL Technical Reports and Professional Papers, largely accessed via the ERIC system, are directed to this broad audience. Journals, professional meetings, and other classical scientific and technical information exchange mechanisms are also used.

But each of these mechanisms involves a packing and rationalizing of information into independent pieces that inherently involves time delays and loses some of the original flavor of the work in the process. To reduce the time interval and retain the freshness of the work, an Annual Working Papers series has been initiated. The thematic topics that provide convenience categories for representing inquiry completed during the past year that is of timely interest to a sector of the educational R&D community will be identified. The documents relevant to these topics will then be organized into the volumes constituting

the Annual Working Papers for that year. "Prototype Testing in Instructional Development" is one of four such volumes for the year 1972. The other three volumes of the 1972 SWRL Working Papers, available through the ERIC system, include the following titles:

Computer-Based Systems to Facilitate Instructional Development (Joseph F. Follettie and Frank Teplitzky, editors)

Design of an Instructional Management System (John F. McManus, editor)

The Integration of Content, Task, and Skills Analysis Techniques in Instructional Design (David W. Bessemer and Edward L. Smith, editors)

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PROTOTYPE TESTING IN INSTRUCTIONAL DEVELOPMENT

Fred C. Niedermeyer

The technology for testing prototypes is highly refined in R&D fields other than education. Although the notion of "field-testing" of instruction appears to be gaining increased rhetorical popularity in education, the transfer of prototype testing technology to educational R&D has received scant attention.

SWRL experience indicates that the development of quality products in education can be greatly enhanced by the testing of prototypes at various stages of development. In early stages, for example, testing may be conducted with a crude prototype, bearing little resemblance to the final product. Testing at this stage is designed to furnish information that will be useful in drafting more refined specifications for the product; thus, the range of subjects will be more limited for this kind of status testing than it will be for testing at later stages when validation is the objective. When properly implemented, prototype testing appears to provide one of the most direct and economical methods for identifying means to optimize the effectiveness of a product, and ultimately to validate a product's effect.

The papers in this volume exemplify several categories of prototype testing conducted at different stages of the development process, under different conditions, and yielding different types of results. Figure 1 is not intended as a complete typology of prototype testing, but merely attempts to focus on some implications of prototype testing that may be

Fig. 1. Categories of Prototype Testing in Illustrated Working Papers

Category Illustrated	Primary Function	Primary Data Source	Working Paper
Status testing	Identify and sequence appropriate outcomes	Pupil performance	1, 2
Comparative studies of prototype materials or procedures	Identify the more effective and efficient materials and procedures	Pupil performance	3
Teacher-administered tryouts of prototype system	Obtain information for revising the system	Lesson observation; teacher and pupil comments	4, 5, 6
Teacher-administered tryouts of fairly finished system	Determine the system's effectiveness over a wide range of school situtations	Pupil performance	7, 8, 9

generalizable to other instructional products with similar development requirements. Additional prototype testing techniques not discussed in this volume include individual or small-group testing of single-exercise prototypes, or small-group testing of a single prospective instructional technique. Furthermore, obvious overlap in the characteristics of different types of prototype testing makes discrete typology impossible.

Prior to the preparation of instructional materials and procedures, status testing can yield useful information about the range of characteristics of prospective learners. In terms of the relative ease with which status testing can be accomplished, it is an efficient means to obtain data that can often prevent costly misjudgment once materials development

begins. Working Papers 1 and 2 describe how status testing was used in selecting and sequencing outcomes and related content for spelling and composition skills instruction. In the spelling example, the data were used to recommend certain types of instructional activities and materials, e.g., contrast exercises between similar sounds and their spelling. In the composition skills study, the data were used to determine which grade levels were appropriate for various writing outcomes, e.g., capitalization.

To analyze and assess the effects of potentially powerful instructional variables, the classical methodology of the comparative experiment provides another useful category of prototype testing. Working Paper 3 describes an experimental investigation of the effects of two manipulated variables--tracing prompts and discrimination craining--on kindergarten handwriting performance. Like status testing, prototype testing at this stage of development can aid in important decisions about product specifications and in avoiding costly modifications later in development. It should be recognized, however, that comparative studies in schoo' settings are inherently costly and difficult, since the results depend upon an adequate sample of classes and schools and upon success in controlling a number of elusive variables, such as teacher implementation and pupil absenteeism. Therefore, such studies make sense only when the expected pay-off is high in terms of the difference the results might make in the subsequent product.

Another category of prototype testing in development involves initial teacher-administered tryouts of instructional programs. Here, the emphasis

is on obtaining observational data and teacher comments that will lead to improvement revisions in the materials and procedures. Because it is usually not expected that the program will be optimally effective at this early stage of development, pupil performance data are of secondary interest. Normally only one or two classes are utilized for these initial tryouts. Working Paper 4 and part of Working Paper 5 exemplify this category of prototype testing in composition skills and drama. Working Paper 6 suggests certain procedures for reporting classroom observation of a program lesson and illustrates these procedures with respect to programs in composition and drama.

After a program has been developed to the point that its various elements have been shown to operate effectively, teacher-administered tryouts are conducted across a wider range of school conditions. Here, pupil performance data are of primary importance. However, the program is still considered to be prototype, and observation data and teacher comments are obtained to further refine the materials and procedures. Working Papers 7, 8, and 9 exemplify this type of testing in a variety of instructional systems.

Working Paper 1

AN ANALYSIS OF THE PERFORMANCE OF THIRD GRADERS ON SWRL'S LEVEL THREE SPELLING CONTENT (TN 2-72-18)

Donna Schwab and Susan Becher

STATEMENT OF THE PROBLEM

In preparing the design of Level Three Spelling (Schwab, 1972), a study was carried out to provide information on the difficulty of selected sound-to-spelling rules planned for inclusion at that level of the spelling program. The major purpose was to estimate which of the rules may be readily acquired by third graders and which therefore probably need not be heavily emphasized in Level Three Spelling. A secondary purpose was to identify common errors made on the more difficult rules.

PARTICIPANTS

Third graders who had not received SWRL spelling instruction were participants in the study. Because local students use the California state-adopted text (Kottmeyer & Claus, 1968), it is clear that their instruction does not cover SWRL's rules (Cronnell, 1971). Six classes of children were used, three from each of two different schools, to provide against unusual school or teacher variables.

MATERIALS

Two to four test words were chosen for each of 53 rules introduced in Level Three spelling (Schwab, 1972). Tested also were 28 Level Two rules reviewed in Level Three to determine whether they need further attention in Level Four. In addition, several rules were tested which

had been taught in Level Two, but for which no indication of difficulty was available from the 1971 tryout or from the Cronnell (1970) study. Thus, in all, 88 rules were of interest. Whenever possible, two or more rules were combined in one test word. One hundred eleven test words were chosen from the Mod 2 lexicon (Berdiansky, Cronnell, & Koehler, 1969). The words were found neither in grades 1-3 of Kottmeyer & Claus (1968), nor in grades 1-3 of the state-adopted Harper-Row reading series. This helped to assure that children would attempt to spell by sound-to-spelling rules rather than by visual memory. Simple context sentences were constructed for each word. They were randomly ordered and broken into three groups of 37 items each for testing. Two classes, one from each school, were tested on each group of words.

PROCEDURE

Test words were presented in regular dictation fashion (word-sentence-word) by a SWRL staff member. Children wrote their answers on answer sheets provided. One test session of approximately 20 minutes was conducted per class.

ANALYSIS AND RESULTS

To obtain equal numbers of responses on test items, a total of 28 spelling tests were deleted at random; thus, data for 20 students in each classroom were actually used for the analysis. Forty responses were examined for each test word. Answers were scored as "no response" only if a child made no attempt to write the word. Unrelated and unreadable responses were counted as errors. Forty-one percent of the

words tested were spelled correctly and 1% of the words tested were scored as "no response." The percentage of errors on whole words differed for the two schools. School A had 47% errors and school B had 68% errors. However, for the purpose of the following analysis of errors, the two schools will be treated together.

To determine which correspondences or structural rules of interest may be readily acquired without specific instruction, from 2-4 examples of each of 88 correspondences were examined. The spellings were simply rated correct or incorrect. Appendix A lists the rules examined in order of increasing difficulty. Results by percentage of correct spellings are reported across schools. Indicated in the column headed "rule source" is the following information coded in the following manner:

S2,3--A rule taught in SWRL's Level Two spelling and reviewed in Level Three spelling.

S3--A rule taught for the first time in SWRL's Level Three spelling.

X--A rule which was taught in SWRL's Level Two spelling but for which no difficulty data were available, a rule taught in Level Two spelling but not formally reviewed in Level Three or a rule previously taught in SWRL's spelling program but here tested in a new environment.

MH--A rule taught[1] in the state-mandated McGraw-Hill spelling series (Kottmeyer & Claus, 1968; books 1-mid 3).

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[1]In many cases the term "taught" must be taken loosely as often it consists of simply having presented several exemplars of the rule (Cronnell, 1971).

Of the 19 rules spelled correctly two-thirds or more of the time, 63% had been taught in McGraw-Hill, 63% are covered in SWRL's Level Two spelling and reviewed in Level Three, and 26% are not taught until Level Three in SWRL's program. Thus, many of the rules reviewed in Level Three spelling will probably not have to be reviewed in Level Four spelling. In general, the children tested seem to have mastered the short vowels. The simple suffixes (-ing, -s, -er, and -ed) and the most common consonant spellings also appear to be well under control.

Of the 55 rules spelled correctly from one-third to two-thirds of the time, only 45% had been taught in McGraw-Hill. Twenty-seven percent are rules taught in SWRL's Level Two spelling and reviewed in Level Three and 40% are rules introduced in SWRL's Level Three spelling program. Many of these rules which appear to be fairly difficult are long vowel spellings, the secondary vowel spellings, vowel + r combinations, some of the less frequently encountered consonant digraphs (such as wh and qu), final double consonants, unstressed vowels and some suffixes (such as -y, -ly, and -es). None of these difficulties are unpredictable (e.g., the secondary vowels cause homophones and the vowels with r's are often distorted and unlike the corresponding short vowel sounds). Only the difficulty of the final double consonants is at all surprising.

Of the 15 rules spelled correctly one-third or less of the time, only 13% had been taught in the McGraw-Hill series by mid third grade. Only one of these rules is taught in SWRL's Level Two spelling and reviewed in Level Three. Fourteen of the remaining rules are introduced in Level Three spelling. It is interesting that /e/ → ay, a rule taught in SWRL's

Level Two program but not reviewed in Level Three, is so difficult. It should perhaps receive more attention in Level Two. In general, the most difficult rules were secondary vowels, vowel + r combinations, internal consonant doubling and structural rules such as y → i and -es or -ed. All these diffuclties could be predicted.

To determine more accurately which spelling confusions occurred, an error analysis was done on all exemplars of all correspondences occurring in the test words. Only those errors which were not made on rules tested in an isolated item and which accounted for over 5% of the total spellings of a certain sound or for over 20% of the total incorrect spellings are discussed in the following section. It should be noted that in some cases, especially when only two examples were tested, 5% of the total occurrences and 20% of the total errors may amount to only 5-10 responses.

Because so few errors were made on initial and single final consonants, they were not, in general, examined. Table 1 indicates the errors of interest, their frequency and common substitutions.

TABLE 1

COMMON ERRORS MADE ON INITIAL AND SINGLE FINAL CONSONANTS

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
/s/ → c/V__e	2	69	s	20	57
/f/ → f/__#	2	81	ff (all on hoof)	12.5	53
/l/ → l/__#	6	72	ll (half on haul)	19	68
/r/ → r/__#	4	71	er (all on flour)	12	45
/z/ → s/V__e	2	81	ss	6	33
/ks/ → x	2	77	cs (all on wax)	5	22

Two of the above substitutions (ll in haul and er in flour) probably result from homophone spellings with which the children may be familiar. Here, and in later listings of substitutions errors, the problem of homophones should be noted. Certainly, they deserve special attention in SWRL's spelling program so that meaning rather than sound may be related to spelling. It is interesting to note the cs misspelling of /ks/ → x. Such an error is reasonable only if children have been taught that /k/ → c/__C. They must learn to limit that generalization in the case of final /ks/ which may only be spelled x (unless it contains a plural marker; then the spelling is cks).

Of more interest, because they are more numerous, are substitution errors made on initial or final consonant digraphs and substitutions made on simple initial or final consonants with more than one possible spelling. Table 2 lists these errors. It can be seen (as was found in the first grade tryout--Schwab, 1971) that the major problem with the spelling of digraphs is the omission of one or the other letter of the pair; sh and ch, however, may be confused because of discrimination difficulties. Wh and w are probably the result of discrimination difficulties for many children who do not have /hw/ in their dialects. Initially, k and c are confused as they were in the first grade tryout (Schwab, 1971) and qu, an infrequently encountered consonant digraph, is often spelled phonetically. Certainly, none of the substitutions are unreasonable and more emphasis is probably needed on the visual aspects of such consonants. Perhaps an occasional review of these difficult and less frequently encountered consonants is in order.

TABLE 2

COMMON ERRORS MADE ON OTHER CONSONANT SPELLINGS

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
/č/ → ch/#__	3	82	c	7.5	39
/ǰ/ → dge/__#	2	20	ge	39	48
			g	14	11
			j	11	9
/k/ → k/#__{e i}	2	91	c	5	35
/k/ → c/#__{o u a C}	13	88	k	4	35
/k/ → ck/V̆__#	3	67	k	15	45
/ŋ/ → ng/__#	2	63	g	12.5	30
			ge	12.5	30
/kw/ → qu/#__	2	39	kw	9	14
			q	7.5	12
			c	7.5	12
			cw	6	10
/š/ → sh/#__	3	81	s	14	74
/š/ → sh/__#	3	72	ch	7.5	26
			s	7	23.5
/č/ → tch/__#	2	48	ch	25	48
/θ/ → th/#__	3	84	t	11	68
/θ/ → th/__#	2	80	t	5	23.5
/hw/ → wh/#__	3	61	w	37.5	94

TABLE 3

SUBSTITUTIONS MADE ON DOUBLE CONSONANTS

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
f → ff/__#	2	30	f	59	82
l → ll/__#	4	52	l	31	78
s → ss/__#	2	53	st	20	41
C → CC/V__V	5	48	C	42.5	82
C → CC/V__{er, ing, ed}	3	20	C	79	95
r → rr (medial)	2	36	r Ø	50 7.5	85 12

The common substitution errors made on double consonants are listed in Table 3. In most cases, it is the omission of one member of the double consonant pair which has caused the spelling error. The st substition for final ss resulted in two real words, past and chest, and may reflect a response bias for more familiar spellings. It may also reflect the children's knowledge that they do not always completely pronounce final consonant clusters and, in the past, have been corrected for not completely spelling them (hence, a hypercorrection). The former explanation is more probable, however, since such spellings did not occur for other final consonants. The omission of the intervocalic r in several cases is interesting to note and may result from r-less dialects.

Errors made on consonants in true clusters or in syllable final or initial position preceding or following another consonant were of quite a different type. A great many more omissions occurred. The data are presented in Table 4.

TABLE 4
SUBSTITUTION ERRORS ON CLUSTERS, PRE-CONSONANTAL, AND POST-CONSONANTAL CONSONANTS

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
/k/ → c/C_{a,o,u,C} (hopscotch)	4	61	k	21	53
/s/ → ce/C__# (bounce)	2	36	s	25	39
			se	11	18
/č/ → ch/C__# (porch)	2	70	ø	6	20
/d/ → d/...C__V... (wonder)	3	79	ø	9	41
/l/ → l/C__V (flew)	10	90	ø	4	41
/m/ → m/C__# (worm)	2	69	me	12.5	40
			ø	9	28
/n/ → n/...V__C... (wonder)	4	71	ø	22.5	78
/n/ → n/V__C# (spend)	4	73	ø	21	79
/r/ → r/C__V (tray)	8	69	ø	16	52
			reversal of r and V	6	19
/r/ → r/...V__C... (cheerful)	3	85	ø	9	61
/r/ → r/__C# (worm)	7	73	ø	15	55
			reversal of r and V	10	36
/t/ → t/...C__V... (tractor)	2	74	ø	11	35
/t/ → t/C__# (kept)	3	74	ø	7.5	29
/t/ → t/C__V (stir)	5	88.5	ø	7	61

It seems clear that second members of final clusters and of some initial clusters are often omitted in children's spellings (see Read, 1971; Schwab, 1971). Whether or not this a problem of incomplete articulation of the cluster in casual, connected speech and thus of incomplete perception for the purpose of spelling is not yet clear but there is some evidence that this is the case (Wolfram, 1968). The spellings of the liquid consonants (/r/ and /n/)[2] appear to be omitted rather frequently even when they are first members of final clusters. Contrast exercises between single final consonants and consonant clusters may be helpful in teaching a child to attend to differences between such word pairs as pour/porch, were/worm, and sped/spend.

The reversals of r and adjacent vowel sounds is also a problem. Because of common intrusive vowels before the /r/ sound and because of the co-articulation of /r/ and /ə/, it is difficult to determine whether the vowel or the /r/ sound comes first. More visual emphasis may be needed on words with internal r's.

Although some of the results of spellings of vowel+r combinations can be determined from the report of r spellings in the preceding table, a separate report of errors on those spelling units follows (Table 5).

Again, the omissions of r (especially before another consonant) is notable. Reversals of r and the adjacent vowel were discussed in

[2]Pre-consonantal /l/ as in welcome and post-consonantal /l/ as in bracelet also appear to have high omissions rates but, as only one exemplar was tested for each environment, the data are not included here.

conjunction with the preceding table. The only other error of interest is the persistence in the use of er to spell any /ər/ sound. This is a reasonable error since it is the most common spelling of /ər/ and the first option which the children learned. Visual emphasis is probably needed on words in which the /ər/ sound is spelled in any way other than er.

TABLE 5

SUBSTITUTION ERRORS ON VOWEL + R UNITS

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
/ar/ → ar (scarf)	2	63	r-less	11	29
			a (a subcategory of the r-less errors)	7.5	19
			r (no vowel)	7.5	19
			reversal of V and r	11	29
/ər/ → ir (thirsty)	2	19	er	32.5	40
			reversal of V and r	7.5	9
			r-less	7.5	9
			r (no vowel)	7.5	9
/or/ → or (porch)	2	66	r-less	10	30
			Ø (all on snowstorm, a rather long word)	7.5	22
/ər/ → or/w__ (worm)	2	57	reversal of V and r	12.5	29
			r-less	11	26
/ər/ → ur (curb)	2	35	er	31	48
			r-less	11	17
			reversal of V and r	9	13
			r (no vowel)	7.5	12

Fortunately, errors on short vowels seem to have decreased considerably by third grade (compare Schwab, 1971). There were no common substitutions for the familiarly spelled /æ/ sound. Other common short and primary nonlong vowel substitutions are as follows:

TABLE 6

ERRORS MADE ON SHORT AND PRIMARY NONLONG VOWELS

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
/ɛ/ → e	6	71	a	8	29
			i	6	21
/ɪ/ → i	14	82	e	7	39
/a/ → o	5	88	a	4	33
/ə/ → u	5	72	a	6	20
			o	6	20
/ɔ/ → a/w__	2	80	o	7.5	43
			e	5	29
/U/ → u	2	70	o	7.5	27
/ə/ → o, o...e	5	62	u	12	31
			a	7	18

Although none of the above error percentages represent particularly high numbers of spellings, an interpretation of the more persistent errors may be useful. As was discovered in the tryout for SWRL's prototype first grade spelling program (Schwab, 1971), /e/ was often spelled a, perhaps because of the letter name influence (Read, 1971) and perhaps because the two sounds are close phonetically and pronounced much alike in many environments in casual American English. The i, e

confusion is probably because the short sounds of the two vowels so often merge, especially before nasal consonants and especially in the speech of Southern Californians.

The a spelling of /a/ is not difficult to attribute to a discrimination problem between the /a/ and /æ/ sounds as both vowels are low, front, and unrounded. /ə/ → u misspelled o and /ə/ → o misspelled u can be explained since children probably know both spellings for the /ə/ sound and since there is no environmental constraint to determine the correct spelling (e.g., sun-son). It is clear, however, that the interference from u, the first learned and most frequently encountered of the /ə/ spellings, is the strongest. The children's a misspelling of /ə/ is more difficult to explain as children have probably had little contact with that spelling of the schwa. (Certainly, McGraw-Hill does not teach it, but then neither does it teach /ə/ → o.) Children have surprisingly little trouble spelling the initial /ə/ as a in the words alive and along. Several factors may help to account for the presence of the a. One factor is an apparent response bias for using a, the first letter of the alphabet and what is probably the first learned and most frequently encountered vowel spelling. Another factor is the possible influence of the word a, often pronounced /ə/. Finally, children may have had much exposure to the common words beginning in a pronounced /ə/ in their reading (e.g., around, about, along, above, alike).

/ɔ/ → a misspelled o is understandable for two reasons. One is that the two sounds merge in the dialects of many children (e.g., cot

and caught are pronounced alike). Another is that the children have probably experienced several /ɔ/ sounds that are spelled o (note the common words dog, fog, log, and frog).

The o misspelling of /ʊ/ → u may be influenced by the roundedness of both vowel sounds or by the common oo spelling of /U/ as in book.

Since many of the above vowel substitutions errors may stem from discrimination problems, vowel sound-spelling contrast exercises (e.g., better-batter, better-bitter, battle-bottle) may still be in order in second grade spelling (see Schwab, 1971, for the suggestion that they be used in first grade spelling). Certainly, an emphasis on the visual nature of words containing vowels with alternate spellings is needed (e.g., ton-tunnel). Relating meaning to spelling should help in the case of homophones (e.g., son-sun, none-nun).

The common errors made on the long vowel spellings are less numerous and less complicated to explain as can be seen in Table 7.

Children are still (as was discovered in the analysis of errrors made in SWRL's first grade spelling tryout) confusing the long and short vowel spellings at the third grade level. The influence of letter names or the careless omission of final silent e's is probably to blame rather than any discrimination difficulty. Spelling contrast exercises on short-long vowel pairs (careful-carful, wedding-weeding) may be helpful in SWRL's Level Three Spelling.

The ea spelling on barefoot is another clear example of homophone misspellings. (Children are undoubtedly more familiar with bear which

McGraw-Hill introduces in their third grade book. In this case, even the meaning of the compound may not be clear to the children. Surely, bears have barefeet--hence, bearfoot.) Again, it seems clear that attention to meaning and the relating of meaning to spelling in the case of homophones is a necessary part of an effective spelling program.

TABLE 7

COMMON ERRORS MADE ON LONG VOWEL SPELLINGS

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
/e/ → a...e	6	49	a	22	43
			ea	8	16
			(all on barefoot)		
/i/ → ee	4	53	e	22.5	52
			ea	7	16
/ay/ → i...e	3	86	i	7	47
/o/ → o...e	2	83	o	7.5	35
/(y)u/ → u...e	2	45	u	15	27
/ay/ → y	2	69	ie	11	37.5
			iy	9	29

The ea misspelling of /i/ → ee is a perfectly possible alternative and no environmental constraints determine the correct spelling. Since McGraw-Hill introduces the ea spelling of /i/ in its third grade book, it is probably fresh in the children's minds. The errors made on the rule, /ay/ → y, are understandable letter name influences. The letter names of ie make a near perfect representation of the /ay/ sound. It is also an

acceptable spelling of the sound. When such alternate spellings occur, as many useful exemplars as possible of each should be taught as program words and the visual nature of vowel spelling should be emphasized.

The common substitution errors made on secondary vowel spellings are more numerous and more complicated to explain. Table 8 lists these common errors.

Sixty-two percent of the common substitutions in Table 8 are familiar alternative spellings for the same sounds. Since words with such ambiguous vowel spellings must be learned individually, this probably indicates a need for teaching as many useful exemplars as possible of those sounds which have alternate spellings (e.g., high, tight, fight, versus lie, pie, tie). Whenever homophones occur, the relationship of meaning and spelling should be emphasized (in Table 8, the influence of the more familiar hall on the spelling of haul and of the more familiar flower on flour can be readily seen).

Only a few indications of possible discrimination difficulty are apparent in the misspellings of secondary vowels. It appears that the spelling of /oy/ and /o/ are confused. This is understandable since the sounds are differentiated only by a glide. Contrasting the sounds and spellings of such pairs as sole and soil or cold and coiled might help.

The a misspelling of /ɛ/ → ea may be a discrimination problem as evidenced by the explanation for the similar substitution of the a for the primary short e vowel spelling. The ow misspelling of /u/ may be partially due to the confusing feature of roundedness on both vowel sounds.

TABLE 8

COMMON SUBSTITUTION ERRORS MADE
ON SECONDARY VOWEL SPELLINGS

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
/ɔ/ → aw	2	33	o	19	27
			a	7.5	11
/o/ → ow	2	74	o	11	39
/o/ → oa	2	39	o	30	49
			o...e	6	10
/U/ → oo	2	64	o	12.5	34.5
			u	11	31
/u/ → oo	2	48	o	22.5	43
			u...e	9	17
/ɔ/ → au	2	25	a (half on haul)	44	53
			o	27.5	33
/e/ → ai	2	53	a	29	60.5
/i/ → ea	2	52	e	24	50
/ɛ/ → ea	2	44	e	34	60
			a	6	11
/e/ → ay	2	31	a	31	45
			ae	11	16
/oy/ → oi	2	45	o	16	30
			o...e	7.5	14
			oy	7.5	14
/u/ → ue	2	27	u...e	12.5	17
			u	11	15.5
			o	9	12
			oo	9	12
/u/ → ew	2	37	ow	10	18
			ue	10	18
			oo	6	11

TABLE 8--continued

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
/i/ → igh	2	24	i...e	39	49
			i	16	21
			ie	6	8
/aw/ → ou	2	44	ow	25	44
			(nearly all on flour)		
			o	17.5	31

The same may be true of the o misspelling of /U/ → oo and /u/ → oo although, presumably, this could also be the simple omission of one member of the secondary vowel pair. This type of omission does occur in consonant digraph and double consonant spellings and it is thus not unreasonable that it might occur in two letter vowel spellings as well. Other indications that this may be true are the a misspelling of /e/ → ai, the e misspelling of /i/ → ea, the a misspelling of /e/ → ay, the u misspelling of /u/ → ue, the i misspelling of /ay/ → igh and the o misspelling of /aw/ → ou. Of course, all but the last of the preceding misspellings could also be attributed to letter name influences as could the ae misspelling of /e/ → ay. Again, visual emphasis on many useful exemplars should improve spelling in the case of words in which the vowels have alternate spellings, but in the case of most of the misspellings above, it may help children to learn that long vowel sounds are rarely (at this level, at least) spelled with single letters. Visual emphasis should help the children fix both letters of the vowel spellings in their minds.

It is interesting to note how infrequently the secondary vowel spellings are confused with one another. This may help answer the question of whether to introduce two secondary vowel spellings of the same sound in the same lesson. Since it is the simple long or short vowels which most often interfere and since these are already taught quite some time before secondary vowels are introduced, the question of sequencing secondary vowels may be less crucial than has been supposed.

Errors on the vowel-consonant combinations, old, ind, and ild (ost had no common errors) show nothing surprising when errors made on consonant clusters (Table 4) are reviewed. Since each was tested only once, however, little of a conclusive nature can be said. Table 9 lists the common errors made.

TABLE 9

ERRORS MADE ON VOWEL-CONSONANT COMBINATIONS

Letter Group	Percent Correct	Common Error	Percent of Total Occurrences	Percent of Total Errors
ild	30	wrong vowel (generally i...e)	57	40
		iled	22.5	32
		d-less	10	14
ind	50	wrong vowel (generally i...e)	27.5	55
		n-less	25	50
		d-less	22.5	45
old	55	wrong vowel (generally o...e)	61	27.5
		l-less	30	67

Again, it is clear that either the final member of a final consonant cluster or the first member of that cluster (if it is a liquid consonant) may be omitted. This is presumably a discrimination-perception problem and could call for the contrast of spelling and sound in such pairs as whine-wind (V.), code-cold, and while-wild. The frequent iled misspelling on mild probably shows the influence of the children's familiarity with past tense forms such as smiled and

may justify special visual attention to the few common ild words such as child, wild, and mild. It is also probably indicative of the need to teach the -ed ending in connection with its meaning.

The few unstressed vowel spellings tested had common substitution errors as shown in Table 10.

TABLE 10

COMMON ERRORS ON UNSTRESSED VOWEL SPELLINGS

Rule	Times Tested	Percent Correct	Common Substitutions	Percent of Total Occurrences	Percent of Total Errors
/ə/ → a/#__	2	83	u	7.5	40
/əl/ → le	2	57	el	10	22
/ər/ → er	4	80	r (no vowel)	6	28
/ən/ → en	2	75	in	10	38
/ət/ → et	2	47	it	26	52.5
			t (no vowel)	6	12.5
/ən/ → on	2	45	en	12.5	22
			in	7.5	13
/ər/ → or	2	24	er	27.5	36
			r-less (all on mirror)	19	25
			r (no vowel)	12.5	16

The substitutions of more familiar spellings for the same sounds can be seen in the u misspelling of /ə/ → a/#__, the en misspelling of /ən/ → on, the er misspelling of /ər/ → or. el is a logical misspelling of /əl/ → le as, indeed, the vowel sound is heard first. The single r misspelling for or and er probably reflects the syllabic nature of the

consonant. A vowel is not always clearly heard. Because the unstressed vowels, especially before consonants such as /n/, /t/, and /s/, are often pronounced /ɪ/, the misspellings in and it for en and et are understandable. It may help to point out to the children that all these final syllables must have vowels in their spellings and that the e is the most common vowel to find there. The exceptions in commonly used words should be carefully learned as individual items.

The r-less spelling of /ər/ → or on mirror probably reflects the difficulty of pronouncing two /Vr/ syllables consecutively. Because of the irregular spelling of the word, it would probably be presented for sight learning in any case. Thus, it would create no problem.

The misspellings on structural or morpheme correspondences or affixing processes are indicated in Table 11.

The only affixes completely omitted are the -s, -ed, -es, and -y. The children presumably can use all these forms in their speech by third grade but they may occasionally omit them in rapid casual speech. This may partially account for the omissions in spelling. The de and dy misspellings of -ty are also presumably related to pronunciation. Unless children learn and practice the number suffix -ty (as in sixty) as a special unit (and McGraw-Hill has not yet introduced it by mid third grade), they are likely to spell it as they say it. Most often that is /di/.

TABLE 11

ERRORS MADE ON MORPHEMES AND AFFIXING PROCESSES

Affix or Process	Times Tested	Percent Correct	Common Error	Percent of Total Occurrences	Percent of Total Errors
-s (plural or 3rd singular)	2	89	∅	5	40
-es (plural or 3rd singular)	2	61	s	10	25
			is	9	22
			∅	7.5	19
-ed (past)	2	80	∅	10	47
-y	4	53	e	22	47
			∅	9	20
			ey	6	13
-est	2	57	es	14	31
-ness	2	39	nes	15	24
			intrusive vowel before n	10	16
			niss	7.5	12
-ful	2	50	full	19	37.5
-ly	2	57	le	12.5	29
			y	6	14
-ty	2	25	dy	14	19
			de	12.5	17
			ten or teen	11	15
y → i and $\begin{Bmatrix}ed\\es\end{Bmatrix}$	2	21	e $\begin{Bmatrix}s\\d\end{Bmatrix}$	21	27
			y $\begin{Bmatrix}s\\d\end{Bmatrix}$	16	21
			y	14	17
			ye $\begin{Bmatrix}s\\d\end{Bmatrix}$	10	13
base + ∅ + suffix	2	73	base + suffix (nearly all on -ing rather then -est)	17.5	70
base + C + suffix	3	20	Base + suffix	79	95
contractions	2	20	no apostrophe	67.5	84
possessives	2	32	no apostrophe (twice as many on pig's as on Tim's)	65	96

-es misspelled is, -est misspelled es, -ness misspelled nes or niss and the intrusive vowels before the -ness suffix are probably additional examples of misspellings related to pronunciations. If the suffixes are learned as units and meaning is related to spelling, this may not occur so frequently.

Since children using the McGraw-Hill spelling series have learned to spell full but have not had the -ful suffix, it is no wonder that several -full misspellings occured for the suffix.

The y misspelling of -ly and the -teen misspelling of -ty may reflect familiarity with substituted forms as well as an expectation set. Children may need extra practice relating meaning to spelling in the cases of these suffixes which sound so similar.

The failure of many children to perform a process (adding a consonant or deleting a silent e) before adding suffixes is clearly a case of never having learned to do so (McGraw-Hill has not yet formally introduced such processes by mid third grade). Similarly, it is understandable that many apostrophes are omitted from contractions and possessives when children have not yet learned to use them. It is interesting to note, however, that few children failed to drop the final silent e in the word whitest which may simply reflect their hesitancy to write two e's together to represent the sound /ə/. Also interesting to note is that fewer children omitted the apostrophe in Tim's than omitted the apostrophe in pig's. Apparently, the idea that possession by people is represented by 's is not as unfamiliar as the same idea in relation to animals.

Also, the plural word pigs is familiar whereas the plural word Tims is not common. Some extra work on possessives with animal nouns may be needed.

In conclusion, most of the common spelling errors made by the third grade children studied were not unreasonable errors. Many were simply alternative spellings of the same sound. Such errors may indicate the need to teach individually many commonly used exemplars of sounds with alternative spellings. Correct transfer cannot be expected to occur on such items. The visual nature of the graphemes alternatively representing the same sound should always be stressed in an effective spelling program. This is particularly true where homophones are concerned.

Other errors (such as writing incomplete consonant clusters or confusing the spellings of two vowel sounds), suggest discrimination difficulty and, in most cases, are not different from those errors found in the first grade spelling tryout (Schwab, 1971). Contrast exercises between the similar sounds and their spellings is probably in order.

Other errors suggest letter name interferences (especially with vowels and syllabic consonants). Emphasis on the fact that letter names and the sounds that letters represent are not usually the same may help. Continuing practice with short and long vowel pairs may also help to alleviate what appears to be a problem caused by letter name interference.

The study completed has thus suggested several groups of correspondences which probably need not be emphasized in Level Three Spelling instruction. It has also suggested common errors made on those correspondence rules which are difficult for children in the third grade.

APPENDIX A

RANK ORDERING OF RULE DIFFICULTY

Rule Source	Rule	Example	Number of Examples Examined	Percent of Correct Spelling
S3; MH	/oy/ → oy	tomboy	2	99
S2,3; MH	/æ/ → a	pass	4	93
S2,3; MH	-ing	winning	2	93
S2,3	/k/ → k/#__{i, e}	kept	2	91
S2,3; MH	-s (plural or 3rd person singular)	sleeps	2	89
S3	/z/ → s/V__e	fuse	2	89
S2,3; MH	/ay/ → i...e	slice	3	86
S2,3; MH	/a/ → o	hopscotch	4	86
S2,3	/k/ → c/#__{a, o, u}	cube	3	85
S2,3; MH	-er	catcher	2	85
S3; MH	/ər/ → er/__#	shower	2	85
S3	/ə/ → a/#__	alive	2	83
S2,3; MH	/o/ → o...e	close	2	83
S3; MH	compounds (joining)	barefoot	3	83
S2,3	/č/ → ch/#__	chess	3	82
S2,3	/š/ → sh /#__	shake	2	81
X	/f/ → f/V__e# (VV__#; C__#)	hoof	3	81
S3; MH	-ed	painted	2	80
X	/θ/ → th/__#	teeth	2	80

Rule Source	Rule	Example	Number of Examples Examined	Percent of Correct Spelling
S3	/ǰ/ → g/V__e	stage	2	80
S3	/ɔ/, /a/ → a/w__	wallet	2	80
X; MH	/ks/ → x	sixty	2	77
S2, 3; MH	/ɪ/ → i	whip	4	77
S3	/ən/ → en/__#	oven	2	75
S2, 3; MH	/ɛ/ → e	spend	4	75
S3; MH	/o/ → ow	slowly	2	74
S3; MH	/ay/ → ie/__#	lie	2	74
X	/k/ → c/__{a, o, u} (medial)	welcome	2	73
S3; MH	/V̄CC/ → VCC	mild	4	73
S2,3	/CC/ → CC/__#	kept	4	73
S3	base and # and suffix	whitest	2	73
S3	/č/ → ch/C__#	porch	2	70
S2,3; MH	/ə/ → u	sudden	4	70
S2,3	/U/ → u	bush	2	70
S3	/s/ → c/V̆__e	slice	2	69
X; MH	/ay/ → y/__#	dry	2	69
S2,3; MH	/k/ → ck/V̆__	thickest	3	67
S2,3; MH	/or/ → or	porch	2	66
S3; MH	/U/ → oo	hoof	2	64
S3	/ə/ → o	oven	2	64
S3	/ə/ → o...e	dove	2	64
S2,3	/ŋ/ → ng/__#	strong	2	63

Rule Source	Rule	Example	Number of Examples Examined	Percent of Correct Spelling
S2,3; MH	/ar/ → ar	scarf	2	63
S3; MH	-es (plural or 3rd person singular)	wishes	2	61
S2,3	/w/, /hw/ → wh	whip	2	61
S3; MH	/aw/ → ow	shower	2	61
S3	-ly	clearly	2	57
S3	-est	thickest	2	57
S3	/æ/ → /le/__#	bottle	2	57
S3; MH	/ər/ → or/w__	worm	2	57
S3; MH	-y	crunchy	2	54
S3	/i/ → y/__#	dairy	2	53
S2,3; MH	/s/ → ss/__#	chess	2	53
S2,3; MH	/e/ → a...e	shake	4	53
S3; MH	/e/ → ai	painted	2	53
S3; MH	ī → ea	teaches	2	52
S3	/CCC/ → CCC/#__	strong	2	51
S3	-ful	bashful	2	50
S3; MH	/u/ → oo	noodle	2	50
S3	/č/ → tch/__#	catcher	2	48
S2,3; MH	/l/ → ll/__#	quill	3	48
S3	/C/ → CC/__ {en, le, on}	sudden	3	47
S3	/ət/ → et/__#	bracelet	2	47
S3	/ən/ → on/__#	cannon	2	45
S2,3	/(y)u/ → u...e	fuse	2	45

Rule Source	Rule	Example	Number of Examples Examined	Percent of Correct Spelling
X	/i/ → ee	teeth	3	45
S3	/oy/ → oi	soil	2	45
S3; MH	/ɛ/ → ea	dead	2	44
S3; MH	/aw/ → ou	bounce	2	44
S3; MH	/o/ → oa	roar	2	39
S3	-ness	illness	2	39
S2,3	/kw/ → qu	quill	2	39
S3	/(y)u/ → ew	flew	2	37
S3	/s/ → ce/C__#	bounce	2	36
S2,3; MH	/ər/ → ur	curb	2	35
S3	/ɔ/ → aw	thaw	2	33
S3	possessives	pig's	2	32
X; MH	/e/ → ay	tray	2	31
S3	/f/ → ff/__#	cliff	2	30
S3	/(y)u/ → ue	fuel	2	27
S3	/ɔ/ → au	haul	2	25
S3	-ty	sixty	2	25
S3; MH	/ay/ → igh	tight	2	24
S3	/ər/ → or/__#	tractor	2	24
S3	y → i + -es, -ed	bunnies	2	21
S3	base + C + suffix	canned	3	20
S3	/ǰ/ → dge/V̆__#	judge	2	20
S3	contractions	how's	2	20
S2,3	/ər/ → ir	thirsty	2	19

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Working Paper 2

FUNCTIONS OF STATUS TESTING IN THE DEVELOPMENT OF AN INSTRUCTIONAL SYSTEM

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Measuring the pre-instructional status of students on specified outcomes is a well-recognized educational technique. Conventionally, such status testing is administered immediately prior to instruction to serve as comparison data for post-instructional evaluation measures. The data is also sometimes used to place students in appropriate segments of instruction.

Status testing occurs less commonly as a standard pre-development procedure, yet it is particularly during the first stages of instructional design that status testing data can contribute invaluable information to program development. Perhaps the most basic function of status testing is to confirm that a requirement exists for instruction on proposed outcomes. Relatively recent recommendations to conduct needs assessments (Klein, 1972) represent recognition of the value of status testing for program formulation. However, little attention has been directed toward the additional information that status testing data can furnish to program formulation and development. Status testing can not only establish that learners may indeed profit from proposed materials, but can also suggest new outcomes and thus extend the scope of the initially specified objectives.

Status testing can also help to sequence outcomes. Given status scores of pupils across several grade levels, it is possible to determine the topography of outcome achievement under prevailing conditions

of instruction. This in turn suggests the aspects of instruction such students are likely to find easy and difficult, and allows for differential specifications of outcomes and materials appropriate for identified groups of learners.

This paper describes status testing conducted by SWRL for a composition skills program at the primary level. The implications of the status testing data will be used to illustrate three functions of status testing related to program planning: (1) confirming a requirement for instruction on proposed outcomes, (2) suggesting additional outcomes, and (3) sequencing outcomes for instruction.

METHOD

Outcomes to be tested were organized according to three areas of written composition: (1) letter formation, (2) editing, and (3) composing. Within each area outcomes were tentatively selected and specified for testing in kindergarten through third grade. Letter formation skills were tested by presentation of 12 model letters that the children were to copy and 12 letters presented orally. Kindergarten children received items of both types; first grade children received items of the second type only. Editing outcomes related to word spacing, ending punctuation, comma placement in dates and addresses, and capitalization of proper nouns and the first words in sentences. Editing outcomes were assessed by sentences dictated to the children. The number of sentences dictated and the kinds of editing skills assessed varied by grade level. Composing skills related to ability to write complete sentences and to the quality, organization, and

originality of the composition. Composing outcomes were assessed from compositions written by first through third graders in response to an illustration and a short description of it.

Approximately 960 students from 32 classes in eight schools drawn from four urban school districts participated in the testing. The districts represented the following socio-economic and ethnic levels: low-income, Black; low-income, Mexican-American; middle-income, White; and upper-middle-income, White. Children from two schools within each of the districts were tested. Thus, for each grade level, children from eight classes--approximately 240 pupils--were tested.

Tests were administered to each class by trained personnel using specified procedures. Kindergarten testing required approximately 20 minutes, first grade testing consumed approximately 30 minutes, and second and third grade testing required 25 and 35 minutes, respectively.

All tests were coded by district, school, class, and grade. Ten papers from each class were then randomly selected for scoring. Raters were trained in scoring criteria for items requiring objective or subjective ratings. Inter-rater reliabilities computed for the subjective scales were above .85.

RESULTS

Scores for each outcome were summed across the four districts. At each grade level, 80 tests were scored, for a total of 320 tests across the four grade levels.

Letter Formation Outcomes

Table 1 displays the distribution of legibility ratings on letter formation outcomes for kindergarten and first grade children. Letters written when the kindergarten children copied were somewhat more legible than when the children wrote from dictation, although under both conditions the percentages of letters receiving a rating of 4 (quite legible) or higher was quite low (nine percent and one percent, respectively). In first grade the percentage of letters receiving ratings of 4 or 5 was higher, but was still only 32 percent.

TABLE 1

PERCENTAGE DISTRIBUTION OF RATINGS ON LETTER FORMATION

Rating	Kindergarten Letter Copying	Kindergarten Letter Dictation	Kindergarten Letter Dictation
5 (very legible)	1	0	3
4 (quite legible)	8	1	29
3 (fairly legible)	27	6	39
2 (barely legible)	42	34	16
1 (completely illegible)	12	39	12
0 (no response)	10	20	1

Editing Outcomes

Table 2 presents the percentages of correct responses to items measuring editing skills on sentences dictated to children in all four grades. For outcomes involving word spacing and writing all words

TABLE 2

PERCENTAGES OF CORRECT RESPONSES ON EDITING OUTCOMES

	Outcomes	Kg	First Grade	Second Grade	Third Grade
3.	Spacing: All words discernible as distinct units	3	42	78	82
4.	Sentence Complete: All words present	6	47	78	82
5.	Initial Capitalization: Correct capitalization of initial letter of sentence	3	40	52	63
6.	Ending Punctuation: Correct ending punctuation	0	5	24	40
7, 9, 11.	Capitalization: Correct capitalization of proper nouns	1	17	34	28
8.	Quotes: Quotes correctly placed around words, punctuation marks placed correctly	--	--	0	0
10, 12-14.	Commas: Comma present in correct place	--	--	5	4

dictated, second grade children performed these tasks correctly 78 percent of the time. However, the scores on these two outcomes for kindergarten and first grade children were considerably lower. Scores on outcomes related to initial capitalization, ending punctuation and capitalization of proper nouns were lower than 50 percent across all grade levels. Scores on comma and quote insertion were lower than five percent.

Composing Outcomes

Table 3 displays the means and standard deviations for the total number of words and sentences in stories written by first, second, and third grade children. There is a steady increase in the average number of words and sentences from grade to grade. However, the mean number of sentences is only 0.9, 1.9, and 3.6 across the three grade levels, respectively.

TABLE 3

MEANS AND STANDARD DEVIATIONS OF TOTAL WORDS AND SENTENCES IN STORIES

		First Grade	Second Grade	Third Grade
Number of Words	$\bar{X}$	7.0	24.0	42.2
	s.d.	8.1	15.9	27.7
Number of Sentences	$\bar{X}$	0.9	1.9	3.6
	s.d.	1.0	1.8	3.3

Table 4 shows the percentages of complete sentences, sentence strings, sentence fragments, and run-on sentences in stories written by first, second, and third grade children. The proportion of complete sentences never rises above two-thirds at any grade level, and less than half of the sentences written by first and second graders are complete. In the first grade, "Sentence Fragments" form the major error category (38 percent), while "Run-on Sentences" are the highest error category in second and third grade (27 and 23 percent, respectively).

TABLE 4

PERCENTAGES OF COMPLETE SENTENCES, SENTENCE STRINGS, SENTENCE FRAGMENTS, AND RUN-ON SENTENCES IN STORIES

	First Grade	Second Grade	Third Grade
Complete Sentences	45	48	67
Sentence Strings	1	11	4
Sentence Fragments	38	14	6
Run-On Sentences	16	27	23

Subjective ratings of quality, originality, and organization of stories written by first, second, and third grade children are displayed in Table 5. Although ratings on all three dimensions tend to increase from grade level to grade level, very few stories received ratings of 4 or 5.

TABLE 5

PERCENTAGE DISTRIBUTION OF SUBJECTIVE RATINGS OF QUALITY, ORIGINALITY, AND ORGANIZATION OF STORIES

Measure:	Overall Quality			Originality			Organization		
Grade:	1	2	3	1	2	3	1	2	3
Ratings									
5 (Excellent)	0	0	1	0	0	0	0	0	0
4 (Good)	0	5	5	0	5	13	0	3	5
3 (Fair)	3	19	38	1	21	36	3	17	36
2 (Somewhat Inadequate)	20	50	46	16	40	35	15	36	46
1 (Extremely Inadequate)	25	16	7	25	20	11	26	29	8
0 (No Response)	52	10	3	58	14	5	56	15	5

Table 6 indicates the percentages of types of organization in the first, second, and third grade compositions. Chronological organization is the only type which occurs with any appreciable frequency. A moderately high proportion of the compositions in second and third grade (approximately 60 percent) are of this organizational type. Plot (conflict and resolution) is the second most common organizational type. The decrease in the proportion of compositions put into the "none" category reflects the fact that more children were at least attempting to write a composition, since a paper was put into this category when no composition was present. Most of the compositions falling into the "other" category were a series of statements about

TABLE 6

PERCENTAGES OF TYPES OF ORGANIZATION IN STORIES

Organizational Type	First Grade	Second Grade	Third Grade
Chronological	17	60	59
Spatial	0	0	1
Plot	0	2	11
Argument	3	0	0
Other	24	24	24
None	56	14	5

the stimulus picture, unorganized by space and with no hint of events coming before or after those portrayed in the picture.

DISCUSSION

The tests administered to primary grade children to assess their status with respect to proposed composition skills outcomes yielded pre-instructional data appropriate for program formulation. Discussion of the data and resulting decisions is organized below according to outcome areas.

Letter Formation Outcomes

Most of the letters and numerals written by kindergarten children were barely legible. At the same time, very few of the children failed to respond at all, i.e., almost all of the children attempted to print. Thus, it seems that kindergarten children could profit from formal

handwriting instruction. Results of these efforts will eventually indicate how much additional instruction, if any, will be required at first grade. Presently, most of the letters written by beginning first graders are fairly legible (or better), but systematic instruction in kindergarten is likely to produce more competent first grade printers.

Editing Outcomes

The need for instruction on all proposed editing outcomes at the primary grade level was confirmed by the status data. Instruction on writing complete sentences, spacing words correctly, capitalizing the first word in a sentence, punctuating the end of a sentence, and capitalizing proper names will begin in first grade, as the data indicate extremely low scores on these outcomes by beginning kindergarteners, and instruction at this level is more likely to profit from emphasis on letter formation. Instruction on capitalizing additional nouns, using commas correctly, and punctuating quotations will take place in the second and third grades.

Composing Outcomes

Analysis of the stories written by first, second, and third graders revealed rather low fluency in terms of the number of words and sentences written. Consequently, it is doubtful that much instruction on composing outcomes such as type of organization and planning interesting story lines can take place if children beginning second grade are able to write stories only two sentences in length, containing only 24 words. Thus, an attempt will be made in first grade to generate writing fluency as a prerequisite for planning and composing instruction in second and third grades.

Instruction on avoiding run-on sentences and sentence strings will begin at the second grade level. Avoiding sentence fragments will be a part of the first grade exercises designed to increase writing fluency.

Ratings of overall quality and organization were generally poor across all grade levels--very few stories received higher than a "fair" rating. Many stories, particularly in first grade, showed a lack of criteria for organization, compounding the difficulties caused by lack of writing fluency. At all grade levels it seems likely that children are unable to organize compositions well because they receive very little systematic instruction and practice on this task. This data suggests the addition of outcomes related to the systematic development of children's abilities for planning written composition, beginning in the first grade. It is expected that instruction on fluency, planning, organization, and editing, will result in an improvement in the overall quality of children's composition.

Thus, the status testing data enabled planning decisions to be made regarding the scope and sequence of proposed outcomes. First, the data revealed the extent to which instruction on an outcome was required at the primary grade level. Second, the data facilitated decisions regarding the level at which instruction on an outcome should commence. While the status testing will also be useful for subsequent program evaluation and as baseline data for successive versions during program development, perhaps the most valuable function of the data is the information it contributes to program formulation.

REFERENCE

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Working Paper 3

THE EFFECTS OF TRACING PROMPTS AND DISCRIMINATION TRAINING ON KINDERGARTEN HANDWRITING PERFORMANCE

Edward Hirsch and Fred C. Niedermeyer

Schools have long provided handwriting instruction as an integral part of their curriculum. While the necessity and desirability of doing so has been challenged on occasion (Stanley, 1963, pp. 239-241), it does not seem likely that conventional handwriting will be an obsolete skill in the near future.

Assuming that handwriting instruction occupies a rightful place in the elementary school curriculum, it is only natural that it be taught in the most effective way possible. This implies that the efficacy of materials and procedures used to teach handwriting should be thoroughly investigated before they are incorporated into an instructional program.

Unfortunately handwriting instruction tends to be based on tradition rather than research (Askov, Otto & Askov, 1970). For example, a survey of opinions of directors of elementary education in 72 metropolitan areas revealed that the choice of methods used to teach handwriting is based on public opinion rather than research evidence (Groff, 1960). Those concerned with improving the quality of handwriting instruction will find little help in the relevant research literature. Anderson (1965), in his analysis of Herrick's (1961) comprehensive bibliography, reported that over 70% of the articles cited are of a non-technical, descriptive nature. Otto (1969) characterized the state of handwriting research by writing that "...there seems to be more interest in finding out what is being done and in telling people what they should be doing than in testing hypotheses or creating new ones [p.577]."

The study reported here represents an attempt to obtain research-based information relevan to young children's learning to print. Treatment variables were selected which seemed to have high potential for improving the state of handwriting instruction.

VARIABLES

Two variables were investigated to determine their effects on the manuscript handwriting performance of kindergarten children. These were type of letter formation practice (copying and faded tracing) and letter discrimination training (its presence and absence).

Most children learn to print by copying letters that have been placed at the front of the classroom, on ditto sheets, or in handwriting texts. Askov, Otto, and Askov (1970), however, in their review of handwriting research during the last decade, suggest that it may be more appropriate for young children to trace letters or to connect dots placed at various points along letter strokes. Their recommendation is based on an interpretation of one aspect of a study conducted by Birch and Lefford (1967). In that study, one of the few to explore the nature of perceptually guided motion, children were required to draw geometric designs with the aid of visual models and various levels of stimulus support. The levels of stimulus support, from high to low, included: (1) guidelines to be traced, (2) dots to be connected, (3) grids to be drawn over, and (4) nothing but the visual models to be copied. Since performance generally declined as stimulus support was removed, Askov et al. may have reasoned that learning to print by tracing and dot-connecting would be easier for young children than learning to print in the conventional way by copying. This line of reasoning does not go far enough, however, for children must eventually be able to form letters without any stimulus support.

A strategy for bridging the gap between tracing and copying becomes apparent when one considers the use of prompts for transferring stimulus control (Taber, Glaser, & Schaefer, 1965). Once it has been established that a desired response is already a part of the student's behavioral repertoire, stimuli associated with the initial repertoire are used as prompts to elicit the desired response. Then the prompts are paired with the stimuli associated with criterion performance and gradually faded (removed) until the desired response is being emitted only in the presence of stimuli associated with the criterion performance. While this process has been used extensively in the field of programed instruction to teach a variety of behaviors, no reports could be found applying it to the teaching of handwriting.

Since children should be able to trace and connect dots with relative ease, dot patterns representing letter forms can be used as prompts in conjunction with visual models to guide students' letter formation movements. Once those movements have been established, the dots can be faded gradually until none remain. At that point, students will be copying the letters. This approach to handwriting instruction is henceforth referred to as faded tracing.

To compare the instructional efficacy of the faded tracing approach with the traditional copying approach, two types of letter formation exercises were developed for use by kindergarten children. The worksheets for the traditional copying treatment required the child to copy each new letter 24 times. In the faded tracing worksheets, however, the child begins by tracing a dotted representation of the letter several times. The dots are gradually faded so that by the 18th response, the child is copying the entire letter on his own. A backward fading technique was

used in the construction of these exercises. That is, dots representing the last stroke are removed first, followed by the dots representing each of the preceding strokes.

Discrimination Training

Both the copying and faded tracing exercises described above contain visual models to be copied at some stage in the instructional sequence. Each visual model may be considered as a discriminative stimulus, that is, a stimulus which must be discriminated from other (potential) stimuli before it evokes the correct response. It may be assumed, therefore, that discrimination training on letter forms will facilitate learning the handwriting task.

Evidence regarding this assumption is contradictory and scant. Kay (Bilodeau, 1969) asserts, without empirical support, that inadequate copying performance sometimes results from the inability to distinguish between the visual patterns to be copied. His assertion appears to have been confirmed by Evans (1961) who found that after training in the discrimination of letter forms, children who had been unable to copy letters were able to draw fair, if imperfect, letters.

In the Birch and Lefford study cited earlier, the authors tried to determine the relationship between perceptual ability and copying performance. They discovered that young children who could not copy figures accurately had little trouble with a recognition task involving those same figures. Even more complex perceptual tasks were, at best, only weakly related to figure copying. Perhaps this suggests that perceptual ability is a necessary but insufficient prerequisite to copying ability. It may mean that only a small group of children, those with perceptual problems,

will need discrimination training before they can be taught to form letters correctly.

Whether or not they are aware of the equivocal research findings discussed above, some teachers (and published programs) require discrimination training for all children learning to write. In light of this practice and the lack of evidence which could be used to support it, it was decided that further study was needed.

To determine the extent to which discrimination training promotes handwriting ability, exercises providing practice on this task were developed. In the letter discrimination exercises, the child was required to identify and circle, from a set of six letters, the ones that matched a model letter. Each distractor differed from the model letter in at least one way: height, width, alignment, orientation, or rotation.

METHOD

Subjects

Three kindergarten classes at an inner-city elementary school in a large metropolitan school district participated in the study. Prior to the study, the teachers reported that they had been giving their children normal kindergarten handwriting instruction on an informal basis.

Dependent Measures

Two tests were constructed for pre-instruction and post-instruction assessment. The first test was a 24-item letter formation test which required Ss to copy both upper and lower case letters. Four types of letters were represented in the test: (1) letters composed of horizontal and/or vertical strokes, (2) letters composed of slanted strokes alone or in conjunction with other straight line strokes, (3) letters that

consist of curved strokes, and (4) letters that have strokes consisting of curves merging with straight lines.

The second test was designed to assess how adequately Ss discriminated between correct and incorrect letter forms. It resembled the previously described letter discrimination exercises. All but one of the twelve items contained one correct alternative. The remaining item contained two correct alternatives. Just as with the discrimination exercises, Ss were required to circle the correct alternative(s).

Procedure

Sixty children from the three kindergarten classes were pretested with both tests approximately a week before instruction began. They were then randomly assigned to four treatment groups in such a way that an equal number of children from each class was assigned to each group. These groups were: Copying Only (CO), Copying plus Discrimination (C+D), Faded Tracing Only (FTO), and Faded Tracing plus Discrimination (FT+D). This arrangement constituted a 2x2 factorial design with the two types of letter formation practice (copying and faded tracing) crossed with the presence and absence of discrimination training.

Instruction began in March and occurred four days a week, for ten weeks. Each instructional session lasted 20 to 25 minutes, depending on the presence or absence of discrimination training. Two letters (often the upper- and lowercase versions of the same letter) were presented in each of the first three sessions. The fourth session was devoted to review. This pattern was occasionally interrupted by the insertion of extra review sessions. During the experiment, 23 uppercase and 22 lowercase letters were presented.

The two groups receiving discrimination training (C+D and FT+D) met in one room while the two non-discrimination groups (CO and FTO) met in an adjacent room. One of two staff members from the Southwest Regional Laboratory was assigned to each room as an experimenter/teacher. His job consisted of administering directions to the Ss, supervising the regular classroom teachers and aides assigned to help in each room, and providing individual feedback to Ss as they were completing their exercises. All adults participating in the study as instructors were rotated between groups and rooms at one- and two-week intervals to counterbalance any potential teacher effects.

In both rooms, the Laboratory representatives began each session by introducing the two letters scheduled for that day. Thereafter, the procedure varied in each room. For the Ss in the discrimination training groups, each student was required to complete a letter discrimination exercise before he was to begin working on the letter formation exercise appropriate to his type-of-practice treatment condition (copying or faded tracing). Letter discrimination exercises required only about five minutes, or less, for completion. In the room with the two non-discrimination groups, each S was required only to work on the appropriate letter formation exercise.

Initially, when separate instructions had to be provided to the faded tracing and the copying groups within each room, the Laboratory representative was assigned to one group while a teacher was assigned to the other. Since each group was provided with a different letter formation exercise, and in the beginning, different verbal directions, the two groups were separated in each room. Written guidelines for

providing individual assistance and feedback were given to all adult instructors.

At the conclusion of the experiment, all of the children were retested with both tests. It was decided to score the tests of only those children who had been present for at least two-thirds of the instructional sessions and who had been tested both before and after the experimental period. This meant scoring two tests from each of 51 children.

The letter discrimination tests were scored by awarding one point for every item in which the S circled only the correct letter(s). Thus, the maximum score on this test was 12.

The letter formation tests were scored by two judges who used a 5-point rating scale of legibility, to assign a score to each printed letter. Both judges were former elementary school teachers. In order to minimize sources of scoring bias, the pretests and the posttests were combined and then divided into two stratified random samples, one sample to be scored by each of the two judges. Each sample contained approximately the same number of tests per treatment condition and exactly the same number of pretests and posttests. Each S was represented in only one sample by both his pretest and posttest. Then the tests were stripped of all identifying marks, numbered, and shuffled.

Before each set of tests was presented to a judge for scoring, both judges rated a sample of 12 randomly selected tests to establish an interjudge reliability coefficient. The combination of high reliability ($r = .89$ on an item-by-item basis) and nonsignificant difference between

their means ($\bar{X}$ = 2.07, $\bar{Y}$ = 2.19, $\underline{df}$ = 574, $\underline{t}$ = .135, n.s.) provided enough evidence to permit each judge to rate half of the remaining tests independently. In addition, after scoring all tests, it was found that the mean ratings assigned to the two randomized samples by the two judges were almost identical, $\bar{X}$ = 2.70 and $\bar{Y}$ = 2.74. The child's total score for the letter formation test was calculated by summing the ratings on all 24 items. Thus, the range of possible scores was from 24 (24 x rating of 1) to 120 (24 x rating of 5).

RESULTS

Performance on Letter Formation Test

Mean total scores, standard deviations, and mean ratings for both pretest and posttest administrations of the letter formation test for all groups are reported in Table 1. Inspection of Table 1 discloses that pretest mean ratings of the four experimental groups are almost identical (range from 2.3 to 2.4), and that pretest to posttest mean rating gains for the four experimental groups range from at least half a point to almost a full point (on the 5-point rating scale), with both copying groups exhibiting higher posttest ratings than the two faded tracing groups.

A two-way ANOVA was conducted on the total letter formation posttest scores of the four experimental groups in Table 1. The results of this analysis are contained in Table 2. A significant type-of-practice main effect was found in favor of the copying treatments over the faded tracing treatments. The second main effect analyzed, discrimination training, was not significant. Nor was there a significant interaction between discrimination training and type-of-practice.

TABLE 1

MEAN TOTAL SCORES, STANDARD DEVIATIONS, AND MEAN RATINGS ON THE 24-ITEM LETTER FORMATION TEST

Experimental Group	*n*	Letter Formation Test					
		Pretest			Posttest		
		Mean Total	Standard Deviation	Mean Rating	Mean Total	Standard Deviation	Mean Rating
CO	12	56.17	13.60	2.3	75.83	10.56	3.2
C+D	13	56.62	11.57	2.4	74.31	10.88	3.1
FTO	12	54.33	13.69	2.3	66.08	11.81	2.8
FT+D	14	54.43	12.75	2.3	69.14	12.25	2.9

TABLE 2

TWO WAY ANALYSIS OF VARIANCE (FOR UNEQUAL CELL FREQUENCIES USING UNWEIGHTED CELL MEAN SOLUTION) ON LETTER FORMATION POSTTEST

Sources of Variation	*df*	Sum of Squares	Mean Square	F
A (Type of practice)	1	706.30811	706.30811	5.41085*
B (Discrimination)	1	7.63845	7.63845	0.05852
AB	1	66.46440	66.46440	0.50917
S/AB (adj.)	47	6135.16797	130.53548	

* Significant at the .025 level.

Performance on Letter Discrimination Tests

Mean scores and standard deviations for both administrations of the letter discrimination test for all four treatment groups are reported in Table 3. An examination of the table reveals several phenomena. In the first place, mean pretest scores varied considerably. Secondly, all groups made substantial gains, with the average gain of the discrimination training groups (4.76 items) larger than the average gain of the non-discrimination training groups (3.38). Finally, both discrimination training groups achieved mean posttest scores above 80 percent (9.6) while the other two groups did not.

A two-way ANOVA was performed on the discrimination posttest scores. Table 4, which summarized that analysis, reveals that a significant main effect was found favoring the groups which received discrimination training over those which did not. There was no significant effect for the type of practice variable, nor was there a significant interaction between type of practice and discrimination training.

DISCUSSION

The purpose of this study was to investigate the effects of two key variables on the manuscript handwriting performance of kindergarten children. The results of the experiment, reported in the preceding section, are discussed below.

Copying vs. Faded Tracing

Contrary to the anticipated outcome, subjects who formed letters solely in response to copying stimuli performed significantly better on the letter formation posttest than subjects who formed letters in response

TABLE 3

MEAN SCORES AND STANDARD DEVIATIONS ON THE 12-ITEM LETTER DISCRIMINATION TEST ADMINISTERED BEFORE AND AFTER INSTRUCTION

Experimental Group	n	Letter Discrimination Test					
		Pre			Post		
		Mean	S.D.	%	Mean	S.D.	%
CO	12	5.17	3.19	43	9.25	1.96	77
FTO	12	3.58	2.31	30	6.25	3.33	52
C+D	13	4.69	3.84	39	9.85	2.85	82
FT+D	14	5.36	3.46	45	9.71	2.79	81

TABLE 4

TWO WAY ANALYSIS OF VARIANCE (FOR UNEQUAL CELL FREQUENCIES USING UNWEIGHTED CELL MEAN SOLUTION) ON LETTER DISCRIMINATION POSTTEST

Sources of Variation	*df*	Sum of Squares	Mean Square	F
A (Type of practice)	1	31.13658	31.13658	4.03
B (Discrimination)	1	52.33762	52.33762	6.78*
AB (Interaction)	1	26.11765	26.11765	3.38
S/AB (adj.)	47	363.04956	7.72446	

* Significant at the .05 level

to copying stimuli and gradually faded tracing prompts. Examinations of the weekly review exercises which were collected, and observations of subjects working on the faded tracing exercises revealed several phenomena which may help to explain this particular outcome: (1) When the tracing prompts were still intact at the beginning of an exercise, some subjects connected the dots representing each stroke with a series of short, discontinuous marks. They thereby failed to gain the appropriate practice of making continuous strokes. (2) With the gradual elimination of dots, from those in the last stroke to those in the first stroke, some subjects ended their letters at the last remaining dot, forgetting, or perhaps not understanding, that they were supposed to complete the letter on their own. (3) Once a significant number of dots had been faded from certain multi-stroke letters, some subjects became confused. They drew lines connecting the wrong dots to each other which resulted in severely malformed letters. Since treatment groups were too large to allow for the provision of timely feedback, a child might have practiced the same error 10 or 15 times before being corrected.

The inability of those subjects to use tracing prompts advantageously parallels a similar finding in the Birch and Lefford study (1970). As was mentioned earlier, subjects in that study generally drew geometric shapes more accurately as stimulus support was increased. There was an exception, however. The youngest subjects sometimes performed more poorly drawing over dot and line grids which also appeared on the stimulus cards than when copying the figures freehand. For many of the kindergarten-age subjects, Birch and Lefford surmised, the grid may have

served as background interference rather than as a facilitative device. Since drawings made over grids were as good as those made by connecting dots by the time children were eight, the authors concluded that the ability to utilize grids effectively is a function of age.

Whether age or experience is the critical factor in enabling children to use ancillary visual information effectively, the experiment reported here provides additional evidence that visual prompts must be chosen carefully in order for them to have a positive effect on motor performance.

In view of the fact that only one type of tracing prompt (dotted letter forms) was used in conjunction with one particular fading strategy (backward fading), it is recommended that additional research be conducted to determine whether or not there is some combination of tracing prompt and fading strategy that would be more effective. Examples of other tracing prompts include: (1) dashed letter patterns, (2) letters consisting of thick, shaded strokes, and (3) shapes, which when outlined by the child, form letters. Examples of other fading strategies include: (1) gradually reducing the darkness of the prompt, (2) gradually eliminating the prompt, starting with the section formed first, (3) gradually eliminating the prompt, beginning with the middle section and working toward both ends simultaneously, (4) gradually reducing the number of complete prompts appearing in each successive row by alternating complete prompts with increasing numbers of blank, copying response positions. Practice exercises incorporating some combination of these may provide a more effective means for teaching letter formation skills than the one utilized in this study.

Discrimination Training

Subjects who received letter discrimination exercises learned to discriminate between correct and incorrect letter forms to the extent that their performance on a test of that ability at the end of the experimental period exceeded 80%. While they performed significantly better on this test than the subjects who did not receive discrimination training, they failed to outperform them on the letter formation posttest. Thus, the type of discrimination training provided in this study does not appear to be an effective treatment for promoting correct letter formation behavior.

CONCLUSION

Traditionally, handwriting has been taught by having children copy letters until their responses approximate the models. Since it has been established that children can trace more easily than they can copy, it was assumed that tracing responses could be maintained while tracing prompts were gradually eliminated. Apparently that procedure was more confusing than the more conventional approach. Until a more effective combination of tracing prompt and fading strategy is developed, there is no justification for abandoning the teaching of handwriting through copying. Furthermore, it may be unwise for teachers to spend valuable instructional time having their students discriminate between correct and incorrect letter forms, since letter discrimination ability does not seem to transfer to letter formation performance.

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Working Paper 4

1971-72 TRYOUT OF LEVEL 3 PROTOTYPE COMPOSITION SKILLS EXERCISES (TN 3-72-43)

Fred C. Niedermeyer, Edys Quellmalz, and Lee Trithart

Thirty-six exercises at Level 3 were written during 1971-72 and tried out in a single, middle-income, surban, second-grade classroom. The outcomes and lessons for this tryout were revisions and extensions resulting from an initial Level 3 tryout during 1970-71 tryout, presents the results, and discusses the results in light of future Level 3 development.

DESCRIPTION OF THE TRYOUT

OUTCOMES

The following outcomes were generated for the 1971-72 Level 3 exercises:

1. Capitalize the first letter of a sentence.
2. Correctly end sentences with periods or question marks.
3. Capitalize proper nouns.
4. Correctly use commas in dates and in dialogue.
5. Correctly place quotes around dialogue.
6. Write complete sentences; avoid sentence run-ons, strings, and fragments.
7. Organize composition into paragraphs and indent each paragraph.

8. Write a story line that is well organized, original (novel), and of high overall quality (well expressed and coherent).

9. Increase the number of words and sentences written in a composition.

TRYOUT AND COMPARISON CLASSES

A single middle-income, suburban, second-grade classroom was selected for the tryout of the Level 3 exercises. One class, rather than several, was utilized because most of the outcomes and lessons were new, and it was not known how appropriate and usable they would be in a teacher-administered situation. Thus, the primary purpose of the tryout was to obtain teacher and pupil comments and observational data in one classroom, so as to identify any gross deficiencies or problems with the materials and teacher procedures. End-of-year pupil achievement was also of interest, and another second-grade class in a nearby school was identified to be pre- and posttested for comparison purposes.

MATERIALS

Thirty-six exercises, organized into three units of 12 exercises each, were written and tried out. In addition, an introductory unit, consisting of 12 exercises sampled from the Level 2 Program,was presented to six children prior to the Level 3 lessons. These children had written less than two sentences in a pretest at the beginning of the tryout, and the Level 2 lessons were administered to promote enough writing fluency for entry into the Level 3 exercises.

Outcomes relating to writing mechanics (Outcomes 1-7) were taught by providing children with response opportunities which progressed from simple to more complex. Three types of exercises were written to structure this sequence: (1) "select" exercises in which the child selected from various stimuli (e.g., words, punctuation marks, or different versions of the same composition) to respond to certain directions (e.g., "Mark the story that is paragraphed properly"), (2) "correct" lessons in which the child corrected errors in given compositions or indicated where corrections should be made, and (3) "construct" lessons where the child wrote compositions and edited for Outcomes 1-7.

Outcome 8 (planning story lines) and, in some ways, Outcome 7 (paragraphing) were taught by having children outline their stories in "planning boxes" prior to writing the entire story.

Outcome 9 (increased fluency) was not taught directly, but was expected to result from the writing practice received when completing the 36 exercises.

Teacher procedures for each lesson were printed on the Teacher's copy. In addition, certain instructional procedures applicable to all lessons were contained in a short Teacher's Guide.

DATA SOURCES

Teacher Questionnaire

A two-page questionnaire was developed. It was completed by the tryout teacher at an end-of-year meeting with the authors. Additional comments, criticisms, and suggestions were also recorded at this meeting.

Lesson Observations

During the tryout, a total of five lessons were observed by Composition Skills staff members. Each observation was recorded on a form used with several Laboratory programs. (See Niedermeyer, 1972.)

Pre- and Posttests

A pretest and a posttest were developed to assess the Level 3 outcomes. The tests were group-administered. On each test children were asked to write eight dictated sentences, and then to write a story cued by an illustration and a dictated introduction.

Outcomes 1-5 (punctuation) were assessed by counting the capitals, commas, etc., in the dictated sentences. Outcomes 6 (strings, run-on's, etc.), 7 (paragraphing), 8 (quality, organization, originality), and 9 (fluency) were assessed through analyses (frequency counts and ratings) of the stories written by the children. All correlations of agreement between judges rating the stories on various criteria (Outcome 8) were .86 or higher.

The tests were administered in both the tryout class and the comparison class. Prior to scoring both the pretest and the posttest, random samples of 20 children were drawn from each class and randomly mixed together.

Pupil Preference Inventory

Two forms of an individually administered pupil preference inventory were developed. Each was administered to a random sample of eight to ten children at the end of the year. During the administration of the inventory, the child was asked to state whether he liked various activities or materials "a whole lot," "a lot," "just ok," or "not at all." There were nine items on each form of the inventory, and all of the various types of exercises and activities from the Level 3 lessons, plus some non-writing activities.

SEQUENCE OF TRYOUT ACTIVITIES

Pretesting at both the tryout class and the comparison class took place during early January of 1972. In mid-January, the Composition Skills staff conducted a one-hour teacher-training session at the tryout school. At this time, the teacher was given the materials and Teacher's Guide. The program outcomes and materials were described and examined, and the teacher procedures were presented and discussed. A schedule indicating at what dates the various exercises should be completed was also provided in order to aid the teacher in completing four units (12 Level 2 exercises and 36 Level 3 exercises) by the end of the school year. The teacher began administering the exercises the following week. Posttesting took place in both classes in late May.

RESULTS

LESSON OBSERVATIONS AND TEACHER QUESTIONNAIRES

Lesson observations of the tryout class and the teacher meeting yielded information concerning use of the program at the second grade level. This information is summarized below.

Pacing

The teacher followed the pacing schedule throughout the tryout and completed all exercises.

Teacher Affect

In judging the appropriateness of the program for her students, the teacher stated that most of the program had been appropriate for the children. The teacher felt that the exercises were generally geared to the children's interests and rated their overall reaction to the program as fairly enthusiastic. The teacher stated that she would definitely like to use the program again.

Time per Exercise

The teacher administered five exercises per week to the six children whose pretest scores indicated they would benefit from the Level 2 review lessons comprising Unit 1. For the Level 3 units, the teacher administered approximately two exercises per week to all children. She estimated that, on the average, each Level 3 exercise had taken about one hour. The times taken for different lesson formats varied greatly, however. The teacher stated that she gave students additional practice on some of the more difficult exercises. Part of this additional practice time was included in the teacher's one-hour per lesson estimate.

Teacher Directions

The teacher felt that the directions for the individual exercises were generally helpful and clear. There were specific times, however, when she would have liked them to be more complete. She indicated she would have preferred more of the instructions to have been worded as she would give them to the class (i.e., scripted).

Teacher's Guide

The teacher found the Guide to be rather scant. She mentioned that after the beginning of the program, she seldom referred to it.

Unit 1: Transition

The teacher considered Unit 1 to be good practice, and wished that the entire class had gone through it.

Unit 2: Emphasis on avoiding sentence strings and run-ons, and indenting paragraphs

In general, the teacher felt that the exercises on avoiding sentence strings and run-ons were too difficult for most of the children. She thought that it was worthwhile to teach the children to avoid using sentence strings, but that the children should be given more practice. She did not think the children needed instruction on avoiding run-on sentences at all. The teacher found the instruction for both these types of exercises to be somewhat confusing. On the other hand, the teacher thought all the exercises on paragraphing were very good and appropriate for the class.

Unit 3: Emphasis on writing friendly letters, descriptive language, and paragraphing

The teacher had favorable comments on the letter writing and paragraphing exercises in this unit. She felt that the children had enjoyed

doing these, and had learned a lot from them. The teacher did not feel, however, that there was any point to the one descriptive-language exercise, unless some follow-up was provided.

Unit 4: Emphasis on dialogue in stories

The teacher felt that dialogue should be taught, but that this unit was too difficult. She suggested that each aspect of punctuating dialogue should be taught independently of other aspects (e.g., using commas and periods should not be taught in the same exercise), and that more total exercises should be given on these skills. The children especially had difficulty paragraphing combined dialogue and narration.

PUPIL ACHIEVEMENT

Table 1 presents the pretest and posttest percentages of correct responses on Outcomes 1-5 as measured through the sentences dictated to second-grade tryout and comparison classes. From the data in Table 1 it may be seen that the percentage of correct responses was markedly higher for the tryout class on the posttest dictated sentences than it was for the comparison class.

Table 2 shows the pretest and posttest means and standard deviations of the total number of words, sentences, and paragraph indentations (Outcomes 9 and 7) in stories written by children in the tryout class and the comparison class. It may be seen that tryout children outperformed comparison children in number of words (90 to 68), number of sentences (12 to five) and number of paragraph indentations (six to one).

Table 1

Pretest and Posttest Percentages of Correct Responses on Editing Outcomes

Outcome Measured	Tryout Class		Comparison Class	
	Pretest	Posttest	Pretest	Posttest
1. Initial capitalization: Correctly capitalized initial letter of sentence (9)	91	92	69	82
2. Capitalization: Correctly capitalized proper nouns (5)	52	69	53	44
3. Ending punctuation: Correct ending punctuation (8)	57	88	32	58
4. Commas: Comma present and correctly placed (3)	5	72	5	8
5. Quotes: Quotes present and correctly placed (2)	0	58	0	8
Number of tests scored	20	20	20	20

Note: Number of items per Outcome indicated in parentheses.

Table 2

Pretest and Posttest Means and Standard Deviations of Total Words, Sentences, and Paragraph Indentations

		Tryout Classes		Comparison Classes	
		Pretest	Posttest	Pretest	Posttest
Number of Words	$\bar{X}$	36.00	89.55	39.50	68.00
	s.d.	17.06	33.84	22.83	28.35
Number of Sentences	$\bar{X}$	3.85	11.75	3.30	5.25
	s.d.	2.01	4.29	3.74	4.27
Number of Paragraph Indentations	$\bar{X}$	0	6.15	0	.05
	s.d.	0	3.02	0	.22
Number of Subjects		20	20	20	20

Table 3 presents the pretest and posttest percentages of complete sentences, sentence strings, sentence fragments, and run-on sentences in stories written by second-grade tryout and comparison classes (Outcome 6). The low posttest frequencies for strings, fragments, and run-on's indicate that this outcome was effectively taught.

Table 4 indicates the pretest and posttest percentage distribution of subjective ratings of quality, originality, and organization for stories written by second-grade tryout and comparison classes (Outcome 8). Even allowing for initial pretest differences between the tryout and comparison classes on some of the ratings, the tryout class had a substantially higher percentage of ratings in the 4 to 5 range on the posttest stories (80%, 95%, and 95%) than did the comparison class (35%, 80%, and 25%).

Table 5 breaks out the punctuation outcomes (Outcomes 1-5, Table 1) into smaller skill units for the tryout class. It may be seen that the skills for which the correct responses were not made 80 percent of the time relate primarily to use of dialogue and dates.

PUPIL PREFERENCE INVENTORY

Tables 6 and 7 indicate the distributions of pupil preference responses to activities in Form A (eight randomly sampled children) and Form B (10 children). It may be seen that no more than one child in each of the samples expressed a dislike of any of the activities.

Table 3

Pretest and Posttest Percentages of Complete Sentences, Sentence Strings, Sentence Fragments, and Run-on Sentences in Stories

	Tryout Classes		Comparison Classes	
	Pretest	Posttest	Pretest	Posttest
Complete Sentences	69	96	39	58
Sentence Strings	5	1	6	2
Sentence Fragments	12	1	29	16
Run-on Sentences	14	3	26	24
Number of Subjects	20	20	20	20

Table 4

Pretest and Posttest Percentage Distribution of Subjective Ratings of Quality, Originality, and Organization of Stories

	Tryout Class						Comparison Class					
	Pretest			Posttest			Pretest			Posttest		
	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization
5 (Excellent)	0	5	0	25	45	45	0	0	0	0	10	0
4 (Good)	30	35	25	55	50	50	0	10	5	35	70	25
3 (Fair)	60	45	65	15	5	5	35	30	30	30	20	30
2 (Somewhat Inadequate)	10	10	5	5	0	0	55	45	40	35	0	40
1 (Extremely Inadequate)	10	5	5	0	0	0	5	10	20	0	0	5
0 (No response)	0	0	0	0	0	0	5	5	5	0	0	0
Number of Subjects	20	20	20	20	20	20	20	20	20	20	20	20
Coefficient of Agreement Between Judges	.89	.91	.88	.91	.87	.86	.89	.91	.88	.91	.87	.86

Table 5

Posttest Percentages of Correct Responses on Editing Outcomes

Outcome Measured	Posttest Percentages
1. Initial capitalization: Correctly capitalizes initial letter of sentence (8)	97
1. Initial capitalization: Correctly capitalizes initial letter of quoted sentence (1)	55
2. Capitalization: Correctly capitalizes initial letter of proper names (5)	69
2. Capitalization: Correctly capitalizes initial letter of months of year (1)	70
3. Ending punctuation: Correct ending punctuation-period (4)	91
3. Ending punctuation: Correct ending punctuation-question mark (3)	87
3. Ending punctuation: Correct ending punctuation-question mark inside quote (1)	80
4. Commas: Present and correctly placed before quote (1)	85
4. Commas: Present and correctly placed after quote (1)	60
4. Commas: Present and correctly placed between day and year in date (1)	70
5. Quotes: Present and correctly placed (2)	58
Number of subjects: 20	

Note: Number of items for each outcome in parantheses.

Table 6

Distribution of Form A Pupil Preference Responses by Eight Second-Grade Tryout Children.

	Do you like to...?		Do you like it...?		
	yes	no	a whole lot	a lot	just o.k.
1. write words and sentences?	8	0	1	2	6
2. do papers like these where you fix up strings and run-ons?	7	1	1	3	4
3. listen to other boys and girls share things they've brought to school?	8	0	3	4	1
4. plan the beginning, middle and end of your story before you write it?	7	1	0	0	8
5. do papers like these where you put quotation marks around what people say?	8	0	2	1	5
6. read stories?	7	1	0	5	3
7. write what boys and girls are saying to each other?	7	1	0	5	3
8. do papers like these where you read two things and put an "X" under the right one?	7	1	3	5	0
9. draw pictures with crayons or paint?	8	0	6	1	1

Table 7

Percentage Distribution of Form B Pupil Preference Responses by Ten Second-Grade Tryout Children

	Do you like to...?		Do you like it...?		
	yes	no	a whole lot	a lot	just o.k.
1. read over what you write and fix your mistakes?	9	1	2	4	3
2. do papers like these where you put an "X" where a new paragraph starts?	10	0	6	2	2
3. listen to other boys and girls share things they've brought to stories?	10	0	5	3	2
4. write stories?	9	1	3	2	4
5. write stories and letters like these?	9	1	3	4	2
6. read stories?	9	1	3	4	2
7. write letters to someone?	9	1	3	3	3
8. plan stories and letters like these?	9	1	4	1	4
9. draw pictures with crayon or paint?	10	0	8	0	1

Children were generally favorable toward most of the activities, with the possible exception of "plan the beginning, middle, and end of your story before you write it" (Form A).

DISCUSSION

The 1971-72 single-classroom tryout of 36 Level 3 Composition Skills exercises provided much information useful for further development. The primary implication of the tryout are as follows:

- The exercises generated generally positive feelings from both the teacher and the children.
- Level 3 success relies heavily on teacher implementation of suggested procedures. For 1972-73 teacher procedures will be placed on separate 5 x 8 cards, as they are in the Drama and Public Speaking Program.
- Pupil performance on avoiding strings and run-on's was good, but teacher procedures need to be rewritten.
- Strategies for teaching dialogue need to be reformulated, and more pupil practice needs to be provided.
- Most of the writing mechanics skills related to punctuation can be effectively taught with the present lesson formats.
- Fluency, originality, and organization do increase substantially as a result of the lessons, even though these outcomes are not taught directly.

For the 1972-73 tryout, the Level 3 outcomes have been expanded in the areas of planning and writing for various purposes (describe, instruct, narrate, entertain). Previously, the outcomes have focused primarily on mechanical skills. The revised structure for the 1972-73 Level 3 tryout appears in Table 8, and is intended to encompass a broader range of useful composition skills for young children.

Table 8

Unit Specifications for Level 3 of Composition Skills

LEVEL	UNIT	PURPOSE	OUTCOMES	CONTENT	ACTIVITIES
3	1	Describe	Plans and writes descriptive composition that: 1) is complete, i.e., does not leave out important objects, persons, or actions 2) accurately places elements according to position, i.e., uses such relational phrases as "next to," "in back of," "on top of" 3) uses words that describe concretely, i.e., refers to color, shape, size, age, weight, texture; avoids adjectives like "pretty" or "good" 4) contains sufficient specific details to distinguish thing described from other similar things, e.g., in describing a classmate, includes sufficient descriptive detail to distinguish classmate described from other classmates Edits descriptions for: 1) beginning capitals and ending punctuation (strings and run-ons) 2) correspondence to standards (criteria) given for descriptive writing	Objects, e.g., zany "Rube Goldberg" type of machine Persons, e.g., illustrated persons or a classmate Scenes with people and animals involved in activities, e.g., circus, zoo Places, e.g., "my bedroom," "our classroom"	Given SWRL-written description, edits for and corrects strings and run-ons Given illustration, written description, and set of standards for a good description, discusses with the teacher and class how description meets standards Plans with teacher and class description that will meet standards Writes description that meets standards (SWRL-provided topics initially; child later given choice of topics or is allowed to choose own topic) Reads description to others so they can guess who or what is being described

LEVEL	UNIT	PURPOSE	OUTCOMES	CONTENT	ACTIVITIES
3	2	Inform (Instruct "How to do X")	Writes a plan (phrases) that: 1) includes all necessary steps in task to be performed 2) has steps in proper sequence Writes composition from plan that: 1) contains sufficient detail within each step so as to produce replicable actions by reader Edits compositions for: 1) correspondence to standards (criteria) given for instructional writing 2) correspondence to plan	Familiar, easily operationalized "How to" topics concerning: Product production, e.g., how to make a peanut butter sandwich, how to make a paper airplane Product maintenance, e.g., how to clean an aquarium, how to feed a dog his supper Game directions, e.g., how to play four-square, how to play "War" School skills, e.g., how to check the answer to a subtraction problem	Given SWRL-written plan, composition, and set of standards, discusses with teacher and class how plan and composition meet standards Corrects and completes SWRL-provided plans and compositions which do not meet standards Writes plans and compositions that meet standards (child given choice of topics and eventually chooses own topic) Reads composition to others and tests replicability of actions; corrects (revises) according to results

LEVEL	UNIT	PURPOSE	OUTCOMES	CONTENT	ACTIVITIES
3	3	Record	Writes a plan for a narrative (phrases) which: 1) follows a chronological sequence 2) narrates a single episode, e.g., "Riding the Matterhorn" is preferable to "My Trip to Disneyland" 3) is complete, i.e., does not leave out important people, events, activities, etc. Writes narrative which: 1) follows the plan for the composition 2) includes specific details that elaborate on the events listed in the outline so as to allow someone who had not had the experience to know what is is like 3) has words and phrases to indicate time or causal relationships, e.g., "then," "after," "when," "because," "so" Edits compositions for 1) standards (criteria) given for recording 2) correspondence to plan	Repeated routine events, e.g., how I get ready for school each day Staged events, e.g., demonstration by a student of how he makes a phone call Single (as opposed to repeated) personal experiences, e.g., when I got lost	Given SWRL-written notes, composition, and set of standards, discusses with teacher and class how notes and composition meet standards Corrects and completes SWRL-provided notes and compositions which do not meet standards Writes notes and compositions that meet standards (child given choice of topics and eventually chooses own topic) Reads composition to others and receives feedback from class on good points of composition according to criteria.

LEVEL	UNIT	PURPOSE	OUTCOMES	CONTENT	ACTIVITIES
3	4	Entertain	Plans and writes story ending which: 1) contains the resolution to the story conflict, i.e., presents a tenable and entertaining solution which is not inconsistent with given story facts to the story problem 2) includes both narration and dialogue Edits compositions for 1) quote related mechanics, i.e., quotation marks, commas, periods, capitals, paragraphing for change of speaker or introduction of narrative passage a. in single sentence b. in compositions	Stories of: Adventure, e.g., superhuman "Plastic Man" stories Mystery, e.g., The Case of the Disappearing Keys Western, e.g., Cattle are being rustled but two boys string up a lariat between the trees and trip up the rustlers. Real-Life Drama, e.g., Two boys canoe down a river, the canoe upsets, and they must get to shore safely.	Given SWRL-written stories, edits in successive lessons for quotes, commas, periods, and capitals in dialogue; discusses paragraphing procedures in dialogue Given SWRL-written stories and standards (criteria) for a good story ending, discusses with the teacher and class how the story meets the standards Plans and writes story ending that meets standards (SWRL-cued solutions initially; child later writes own story solutions) Reads story to others and receives feedback from class on good points of story according to criteria

LEVEL	UNIT	PURPOSE	OUTCOMES	CONTENT	ACTIVITIES
3	5	Entertainment	Plans and writes story which: 1) contains a conflict and resolution i.e., has a problem and presents a tenable solution 2) includes both narration and dialogue Edits compositions for 1) question marks and exclamation points within dialogue	Same as Unit 4	Given SWRL-written stories, edits for question marks and exclamation points in dialogue Writes stories which meet standards (child initially given 1-2 sentence story synopsis specifying story conflict and resolution, then only story conflict; child later given titles to choose from which specify setting and characters, then setting or characters; child later generates own topics for stories) Reads story to others and receives feedback from class on good points of story according to criteria.

Working Paper 5

1971-72 TRYOUTS OF THE SWRL DRAMA AND PUBLIC SPEAKING PROGRAM (TN 3-72-33)

Fred C. Niedermeyer, Dayna Kalins, and Linda Oliver

Levels 1 and 2 of the Drama and Public Speaking Program were initially tried out in several kindergarten and first-grade classes during the Spring of 1971. Results of this tryout indicated that certain revisions were needed in the procedures and materials. Based on the tryout, Level 1 was revised and expanded from 20 lessons to 30 lessons. Both the revised Level 1 and the original Level 2 were then tried out during the entire 1971-72 school year in several schools encompassing a wide range of school locations. In addition, prototype lessons for Level 3 were prepared and were tried out in two second-grade classrooms at a single school. This report (1) documents the procedures used to conduct the 1971-72 tryouts, (2) describes the results of the tryouts, and (3) discusses the results and describes program revisions formulated as a consequence of the tryouts.

METHOD

Materials

From the 20 Level 1 lessons developed for the Spring, 1971 tryout, certain lessons were discarded or revised and other lessons were added to produce 30 lessons. A description of these changes and additions may be found in Niedermeyer (1971). Sample lesson cards and other materials may be found in Oliver, Niedermeyer, and Sullivan (1971).

Thirty Level 3 lessons, similar in format to Levels 1 and 2, were also developed and tried out. The Level 3 lessons were designed to

extend the complexity of the children's performances in pantomime, improvisation, public speaking, and play production. Specific content or performance extentions were as follows:

> Pantomime: The children progressed to pantomiming specified characters and character mannerisms in more complex story situations.
>
> Improvisation: The children began to plan and perform their own stories with the aide of short "story ideas" (i.e., short story sketches which include the essential elements of a good story---setting, characters, conflict, and resolution).
>
> Public Speaking: The children began to plan and present persuasive talks and debates.
>
> Play Production: The children were introduced to scripting their own plays, by completing unfinished play scripts.

Sample

The three levels of the Drama and Public Speaking Program were tried out in a total of 16 kindergarten, first-grade, and second-grade classes in four schools in two districts. Table 1 indicates the specific distribution of classes to levels. In order to determine how well the program would operate in a variety of school settings, try-out schools for Levels 1 and 2 were selected to represent a wide range of populations and locations.

The initial tryout of Level 3 was conducted in only two second-grade classes at a middle-income, suburban school. The tryout was intended to yield information which would produce a revised program suitable for a tryout of wider scope the following year. The particular school for the Level 3 tryout was selected because its children had participated in the Level 2 tryout the previous year.

TABLE 1

Distribution of Tryout Classes to Schools

District	School	Socio-Economic Level	Ethnic Composition	No. Level 1 Classes	No. Level 2 Classes	No. Level 3 Classes
I	A	Low-Income Inner-City	Brown	2	1	
	B	Low-Income Inner-City	Black	3		
	C	Low-Income Inner-City	Black		3	
II	D	Middle-Income Suburban	White	3	2	
	E	Middle-Income Suburban	White			2
		Total Classes at Each Level:		8	6	2

Procedures

One-hour teacher training sessions were conducted at each school by the Product Development staff. Teachers were given materials and Teacher's Guides at this time. The outcomes and activities comprising the program were described, materials were examined, and teaching procedures were presented and discussed.

Teacher training sessions for Levels 1 and 2 took place during late October and early November of 1971. Teachers were to begin the lessons the following week. Schedules were provided which indicated at what dates various lessons should be completed so as to allow for completion of each level by the end of the school year.

A teacher training session for the two Level 3 teachers took place during late January. The teachers agreed to occasionally teach two lessons a week in order to complete the 30 lessons by the end of the school year.

Data Sources

Lesson Observations. During the tryout, classroom lessons were observed by staff members on a regular basis. Procedures for systematically documenting these observations were operationalized (Niedermeyer, 1972). Essentially, these procedures required the observer to write a summary of all that was seen and heard during the lesson, following each observation. Inferences about pupil attitudes and teacher performance, and implications for program materials and procedures were then recorded on the report form. In all, ten Level 1 lessons, seven Level 2 lessons, and eight Level 3 lessons were observed and recorded.

Teacher Questionnaires. Meetings were held with all Level 1 and Level 3 teachers near the end of the school year (late May). At this time, the teachers completed questionnaires designed to elicit revision suggestions and teacher attitudes toward the program. In addition, the teachers were given Lesson Rating Sheets. These asked the teachers to rate each of the 30 lessons for a particular level on overall quality, and to indicate how many sessions per week had been spent on each lesson. Comments, criticisms, and suggestions concerning each lesson were recorded by SWRL staff members. Level 2 teachers were mailed questionnaires. Four of the seven teachers completed and returned their questionnaire.

Pupil Performance Test. A posttest was developed for Level 1 which was a revised version of one used during the Spring, 1971 tryout (Oliver et al., 1971). Whereas the original test was designed to be administered by SWRL staff, the revised test was written to be administered by the classroom teacher. (Posttests for Levels 2 and 3 were not developed and administered, since the Level 2 materials had not been revised and the Level 3 tryout was not intended to obtain pupil performance data.) The test involved having the teacher rate the children's performances on specified outcomes, using a 5-point scale. To determine the teacher's ability to rate the children according to criteria provided in the test, a SWRL staff member observed each Level 1 test administration and also rated the children. (The SWRL observers had been trained in the use of the scale and had administered the test during the previous year's tryout.) Agreement correlations between classroom teachers and SWRL staff members were found to be .82 for pantomime,

.67 for improvisation, and .55 for public speaking (for all three coefficients, $p<.01$). It was felt that the latter two correlations were unacceptably low. Generally, teachers rated the children lower than the trained SWRL observers. This appeared to be a result of disappointment on the part of the teachers when certain children did not perform on the posttest as well as they had been performing during instruction. To correct this problem in the future, changes have been made in the administration directions on the test. The revised version of the test may be found in Niedermeyer and Giguere (1972).

Pupil Preference Inventory. A random sample of 40 kindergarten children (five from each of the eight classes) was interviewed by SWRL staff members, using the Pupil Preference Inventory. Each child was interviewed individually and asked to state whether he liked various activities "a whole lot," "a lot," "just o.k.," or "not at all." The Level 1 Inventory contained eight items, half of which related to drama and public speaking activities and half of which related to other school activities such as singing and coloring. A copy of the Pupil Preference Inventory appears in Appendix A.

RESULTS

Lesson Observations and Teacher Meetings

Lesson observations and teacher meetings yielded much information concerning use of the program at all three levels. This information is summarized in the paragraphs below according to various categories.

Pacing. None of the Level 1 teachers completed the 30 lessons. The average number of lessons completed was 22, but only one of the eight teachers completed fewer than 20 lessons (11). Similarly,

Level 2 teachers completed an average of only 13 out of 20 Level 2 lessons. The two Level 3 teachers each completed 22 of 30 lessons.

Teacher Affect. All but one of the teachers felt the program was appropriate for most of the children. All teachers felt the activities were generally geared to the children's interests and rated the children's overall reaction to the program as enthusiastic. Teachers at one Level 2 school (School C, Table 1) utilized the program with only about half of their students. These teachers indicated that the other children were not "ready" for the program in terms of speaking and reading skills.

Time per Lesson. Most teachers conducted two sessions per weekly lesson, ranging from 15 to 25 minutes each.

Pantomime Lessons. All teachers felt pantomime lessons were the least difficult and most enjoyable for the children. One Level 1 teacher (School B) administered only the pantomime lessons and some improvisation lessons, as she felt the children were not "ready" for the speaking tasks taught in the program.

Improvisation Lessons. Five of the Level 1 teachers in two schools (Schools A and B, Table 1) considered these lessons too difficult for many of the children. They felt their children required more "experience" and "maturity" to perform the tasks. However, Level 1 teachers in one school (School D) and the Level 3 teachers (School E) found the improvisation lessons to be highly successful and "creative" activities. Observation of improvisation activities revealed that the children were having some difficulty with certain lessons, i.e., those requiring the children to make up their own stories to act out.

Public Speaking Lessons. Again the Level 1 teachers in Schools A and B felt that speaking lessons were too difficult and that their children were not "ready." The three teachers in School B stated that they had skipped over many of the public speaking lessons. Three Level 1 teachers in School D and all Level 3 teachers found the activities to be very successful, once the children became familiar with the talk structure (i.e., a beginning, middle, and end for each talk). Observations of lessons in Schools A, D, and E indicated that the speaking tasks may be initially difficult for "low-verbal" children, but appropriate and successful with sufficient practice.

Play Production Lessons. None of the Level 1 teachers had reached the play production lesson area at the time of the teacher meetings. Three Level 2 teachers in two schools (Schools A and D) had conducted two play production lessons (one play and the tongue twisters) and were very happy with the children's responses. Both Level 3 teachers had completed several play production lessons (one play, two dramatic readings) and were extremely enthusiastic about the success of these lessons. Observation of play production lessons indicated that the children enjoyed this part of the program and had little difficulty performing the reading and acting tasks. Certain revisions were indicated, however, to provide the children with more systematic instruction in scripting unfinished plays.

A summary of responses to quantitative items in the teacher questionnaire appears in Appendix B.

Level 1 Pupil Performance Test

Table 2 presents mean ratings and standard deviations for each performance outcome assessed with the Level 1 test in the eight kindergarten 1972 tryout classes. The means are based on ratings made by SWRL observers, not on ratings by teachers. The data are presented for each of the three tryout schools individually. Also shown in Table 2 are mean scores from the Spring, 1971 tryout in 14 middle-income suburban classes (Oliver et al., 1971).

When comparing the 1971 means to the 1972 means for School D (also a middle-income, suburban school), it may be seen that the mean scores for School D were generally higher in pantomime and public speaking, but lower in improvisation. The lower improvisation means for School D were primarily caused by one of the three classes. In this class, the children did not speak during the improvisation test items, but proceeded only to pantomime. (The teacher of this class felt that the children had become confused and shy due to the test situation. She indicated that these children had performed extremely well in the past during instruction.) Mean scores for Schools A and B (different socio-economic levels and minority group populations than School D and the 1971 classes) were generally lower, with School B being especially low in public speaking and improvisation.

Performances in all three 1972 schools generally averaged 3 or higher for pantomime. (Ratings of 3, 4, and 5 represent "fair," "good," and "excellent" performances, respectively. Scores of 1 or 2 represent "very poor" and "poor" performances.

For public speaking and improvisation, however, means generally were 3 or higher (comparable to the 1971 scores) only for School D.

Pupil Preference Inventory

Table 3 indicates percentage distribution for how well the kindergarten children stated that they liked various activities. As may be seen, the children showed high preferences for drama and public speaking activities as frequently, if not more so, than for other assessed school activities.

DISCUSSION

Lesson observations and teacher meetings provided information useful at all three levels for formulating lesson revisions. Changes specified on the basis of this tryout may be examined by noting the 1972-73 lesson summaries for Levels 1-3 in Niedermeyer, Oliver, and Kalins (1972). The primary revisions are as follows:

- Many of the improvisation and play production lessons will be rewritten to provide a more systematic and gradual development of story planning skills.

- "Chain Story" lessons, where children take turns adding to the narration of a story, will be deleted from Level 1 and the beginning of Level 2, because they do not correspond to the new story planning specifications. (Children had considerable difficulty with these lessons in that they simply "rambled on" without creating a plot containing a conflict and a resolution.)

- Many play production lessons will also be rewritten to include systematic instruction in the scripting of incomplete and original plays.

- The procedure of acting out stories one sentence at a time proved to be too detailed and time consuming. Instead, teachers will have the children act out stories in short sentence-groups (i.e., slash-marks will be placed after every group of two or three sentences in the stories; the teacher will stop the performance

TABLE 2

Performance Ratings for 1971 and 1972 Level 1 Tryouts

OUTCOME	1972 School A $\bar{X}$	1972 School A s.d.	1972 School B $\bar{X}$	1972 School B s.d.	1972 School D $\bar{X}$	1972 School D s.d.	1972 Total $\bar{X}$	1972 Total s.d.	1971 $\bar{X}$
Pantomime									
a. The child's facial expressions portrayed the situation being pantomimed.	3.16	1.11	3.11	1.32	3.66	1.37	3.35	1.31	2.8
b. The child's gestures portrayed the situation being pantomimed.	3.25	1.35	3.22	1.21	4.00	1.23	3.52	1.28	3.2
c. The child was confident and relaxed.	2.58	1.16	3.05	1.21	4.00	1.28	3.29	1.38	3.0
d. The child seemed involved in his performance.	2.50	1.08	2.77	1.14	3.88	1.13	3.12	1.24	2.9
Public Speaking									
a. The child's talk included several appropriate and imaginative examples or reasons related to the topic.	3.16	0.93	2.11	1.07	2.72	1.40	2.60	1.23	2.4
b. The child's talk had continuity, i.e., the sentences related and built upon each other.	2.50	0.67	1.72	0.95	2.94	1.69	2.37	1.33	2.5
c. The child spoke fluently in complete sentences without many long pauses.	2.25	0.75	2.00	0.97	3.11	1.81	2.47	1.38	2.4
d. The child spoke clearly with adequate voice volume.	2.25	1.05	1.50	0.78	3.11	1.81	2.29	1.47	2.6
e. The child's talk had a beginning, middle, and end.	2.16	0.71	1.22	0.54	3.11	1.74	2.16	1.14	---

Table 2--continued

OUTCOME	1972 School A $\bar{X}$	1972 School A s.d.	1972 School B $\bar{X}$	1972 School B s.d.	1972 School D $\bar{X}$	1972 School D s.d.	1972 Total $\bar{X}$	1972 Total s.d.	1971 $\bar{X}$
Improvisation									
a. The child's lines followed and contributed to the story.	2.00	0.95	1.50	0.67	3.05	1.51	2.30	1.33	3.5
b. The child improvised a considerable amount of dialogue.	2.08	1.16	1.58	0.79	2.66	1.28	2.19	1.19	---
c. The child used gestures, movements, and facial expressions that followed the story.	2.66	0.49	1.91	1.16	4.00	0.59	3.02	1.17	4.5
d. The child spoke clearly with adequate volume.	1.83	0.93	1.41	0.79	2.77	1.62	2.11	1.36	3.7
e. The child seemed involved in his performance.	1.83	0.83	1.75	1.05	3.66	0.76	2.59	1.26	4.1

TABLE 3

Percentage Distribution of Preference Responses by 40 Randomly Sampled Kindergarten Children

Item	A. Liked a whole lot	B. Liked a lot	C. Liked just o.k.	D. Did not like	E. Did not do
Drama and Public Speaking Activities					
·Act out things without using words	45	26	29	3	12
·Act out stories, making up your own words for the people in the stories to say	44	34	22	0	20
·Give short talks about things like "What is my favorite pet?"	44	28	28	6	15
·Read a play and act it out for the rest of the class	42	32	25	3	27
$\bar{X}$	44	30	26	3	18
Other Activities					
·Sing songs with the class	38	30	32	0	7
·Color or paint pictures	54	20	23	3	10
·Listen to other boys and girls share things they have brought to school	47	31	22	11	10
·Read a book	43	32	25	3	7
$\bar{X}$	46	28	26	4	9

Note: Percentages add up to more than 100 because categories A, B, and C were differentiated after the child indicated a simple yes-no preference for the activity.

of the story at these slash-marks and either have the children practice this segment again, or change performers so that many children will have an opportunity to practice the story). All stories which are to be administered utilizing this procedure, will be revised to include the sentence-groups.

- Many children had difficulty starting and stopping their own performances. Therefore, cues will now be provided on the lesson cards for the teacher to use to start and stop performances. These cues will be "Action" for start and "Cut" for stop.

- Dramatic reading lessons will be added to Level 1 and have been included in the recent revisions of Level 2. Dramatic reading lessons were found to be very successful in Level 3.

- Several stories were found to be too long, uninteresting, or extremely difficult for the children to act out, and will be rewritten or deleted.

- To increase pacing, the Teacher's Guide emphasizes planning and scheduling, and explicates several scheduling options.

Pupil performance data for Level 1 revealed that the children in the three middle-income, suburban classes at School D performed better in pantomime and public speaking than similar children in the previous year. This improvement was anticipated, since additional public speaking lessons were added following the 1971-72 tryout and teaching procedures for pantomime were extensively revised. School D's scores were generally lower in improvisation, but this was primarily a consequence of poor performance in one of the three classes. Overall, the program continues to develop dramatic and public speaking skills of middle-income, suburban children.

The pupil performance ratings were considerably lower in the five Level 1 classes in two low-income, inner-city schools. This was true particularly for public speaking and improvisation, where oral expression is required. One cause of this problem may be teachers' low expectations of what inner-city children are capable of learning in regard to oral-language skills. As has been described, inner-city

teachers generally expressed doubts whether many of their children were "ready" for the drama and public speaking activities, particularly those which required oral expression. Level 1 teachers at School B skipped entire lessons dealing with improvisation and public speaking because they felt the speaking activities were too difficult for their "low-verbal" children. Level 1 teachers at School A (as well as Level 2 teachers at School C) placed only some of their children (the more "verbal" children) in the program. Thus, many of the children received little, if any, instruction and practice.

Teacher training efforts failed to communicate to inner-city teachers that the goal of the Drama and Public Speaking Program was to promote oral expression in <u>all</u> children in the primary grades, i.e., both the so-called "verbal" and "low-verbal" children. When initial speaking activities proved difficult for some children, the teacher's response was to assume that these children were "not ready" for the program, and were incapable at the time of acquiring the necessary oral-language skills to perform the activities. The teacher would either remove these "non-verbal" children from the program or discard the "difficult" lessons, rather than allowing the children consistent practice opportunities to obtain the skills.

One emphasis needed for future teacher training activities should be to convince the teachers to take responsibility for instructing all children. One can only wonder how these "low-verbal" children will ever learn to speak if they are not given frequent opportunities to do so. While it is not intended for the speaking activities in the program to frustrate and discourage children, neither is it desired that their verbal skill development go unattended. The teacher needs to

find the proper balance between discouragement and encouragement.

For the 1972-73 version of the program, attempts have been made to address the teacher expectation problem through the Teacher's Guide. In a question-answer format, each guide informs the teacher to expect initial speaking activities and skills to be difficult for many children. However, the teacher is asked to assume the responsibility for providing children with frequent opportunities to practice and develop their oral-language skills. For the children who are reluctant to speak, procedures have been described which direct the teacher to assist the child in any way, even if it means initially telling him what to say and having him repeat it. A copy of the revised Level 1 Teacher's Guide may be found in Niedermeyer et al., (1972).

APPENDIX A

PUPIL PREFERENCE INVENTORY
DRAMA AND PUBLIC SPEAKING PROGRAM

Teacher_____

Date_____

Examiner_____

Directions

I. Make the child feel at ease.
II. Then say, "I AM GOING TO ASK YOU SOME EASY QUESTIONS ABOUT THE THINGS YOU DO IN SCHOOL."
III. For each item below, ask the series of three questions (a, b, c), and record the child's responses. If the child responds negatively to the first question ("...DID YOU EVER...?"), try to determine if he really hasn't participated in the activity or simply fails to recognize it from the description given.

	(a) IN SCHOOL THIS YEAR DID YOU EVER...?		(b) DO YOU LIKE TO...?		(c) DO YOU LIKE IT...?		
	yes	no	yes	no	A WHOLE LOT	A LOT	JUST OK
1. SING SONGS WITH THE CLASS?	___	___	___	___	___	___	___
2. ACT OUT THINGS WITHOUT USING WORDS, LIKE PUTTING ON A JACKET OR THROWING A BALL?	___	___	___	___	___	___	___
3. COLOR OR PAINT PICTURES?	___	___	___	___	___	___	___
4. ACT OUT STORIES, MAKING UP YOUR OWN WORDS FOR THE PEOPLE IN THE STORIES TO SAY?	___	___	___	___	___	___	___
5. LISTEN TO OTHER BOYS AND GIRLS SHARE THINGS THEY HAVE BROUGHT TO SCHOOL?	___	___	___	___	___	___	___
6. GIVE SHORT TALKS ABOUT THINGS LIKE "WHAT IS MY FAVORITE PET?" OR "WHAT I DO WHEN I COME HOME FROM SCHOOL?"	___	___	___	___	___	___	___
7. READ A BOOK?	___	___	___	___	___	___	___
8. READ A PLAY AND ACT IT OUT FOR THE REST OF THE CLASS?	___	___	___	___	___	___	___

APPENDIX B

Percentage Distribution of Responses
To Questionnaire from 15 Teachers for Levels 1-3

SWRL Drama and Public Speaking Program
Spring, 1972

TEACHER QUESTIONNAIRE

The SWRL Drama and Public Speaking Program is now in its second year of development. In order that we may evaluate and further improve the program, it is essential that we obtain your comments, criticisms, and suggestions with this questionnaire. Thank you.

1. To date, how many lessons of the entire program have you completed?
   _____ (no. of lessons) (percentage by level)
   Comments:
   Level 1 - 70% Level 3 - 73%
   Level 2 - 72%

2. On the average, what proportion of your class has received instruction for each of these lessons?
   ____ less than one-fourth
   7% between one-fourth and half
   13% between half and three-fourths
   80% more than three-fourths
   Comments:

3. Is the program appropriate for most of your children?
   94% yes
   6% no
   Comments:

4. Were the activities (stories, talk topics) generally geared to the children's interests?
   100% yes
   ____ no
   Comments:

5. What was the overall reaction of your class to the program?
   60% very enthusiastic
   40% fairly enthusiastic
   ____ neutral
   ____ fairly unenthusiastic
   ____ very unenthusiastic
   Comments:

6. How many sessions per week did you generally conduct for each lesson?
   6% one
   54% two
   34% three
   6% four
   ____ five or more
   Comments:

7. How long was each session, on the average?

13% less than 15 minutes	13% 25 - 35 minutes
74% 15 - 25 minutes	____ more than 35 minutes

Comments:

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Working Paper 6

OBSERVATION PROCEDURES FOR CLASSROOM TRYOUT OF INSTRUCTIONAL MATERIALS AND PROCEDURES (TN 3-72-15)

Fred C. Niedermeyer

During teacher-administered tryouts of an instructional program, staff observations of classroom lessons are an important data source for later formulation of revisions. However, these data are often unavailable when needed because of a lack of systematic procedures for collection and reporting. This paper suggests certain procedures for reporting classroom observation of a program lesson. These procedures are illustrated in the observation of two Laboratory programs: Composition Skills and Drama and Public Speaking.

Observation Reporting Forms

Figure 1 is a sample observation reporting form currently being used in the Composition Skills Program. Staff observers complete the form following each observation. Copies of the report are distributed to the Activity Head and each staff member and are kept in loose-leaf notebooks.

The heading of the form in Figure 1 contains various information categories useful to those reviewing the observation report. In addition to the lesson number, it includes a brief description of the lesson. This helps the reader recall the specific lesson without having to rummage through his files to find the actual lesson. Indications of the size and level of the group of children involved in the lesson and the length of the lesson are useful for later comparisons and analyses.

Fig. 1. Sample Observation Reporting Form

PROGRAM: Level 1 Composition Skills.....Spring, 1972, Tryout	
DATE:	UNIT AND LESSON NO.:
SCHOOL:	LESSON DESCRIPTION:
TEACHER:	SIZE AND LEVEL OF GROUP:
OBSERVER:	TIME SPAN:

OBSERVATION

INFERENCES AND IMPLICATIONS
(Related to Teacher Procedures--TP, Materials--M, Other--O)

The body of the observation report is divided into two sections: (1) observations and (2) inferences and implications. The observation section should be an objective description of what was seen and heard during the lesson. If it is well-written, it should allow the reader to make valid decisions about the extent to which recommended program procedures were followed during the lesson.

The latter section contains inferences about the lesson. Useful inferences will have implication for confirming the adequacy of program materials and procedures or for suggesting new ones. The writer should be free to suggest program revisions at this point, rather than wait until later. Generally the inferences should deal with the following areas:

- teacher implementation of suggested procedures
- pupil problems in responding to teacher or materials
- extent to which children seemed to enjoy the lesson
- teacher comments and apparent attitude about the lesson or the program.

It is possible for the writer to code the comments in this section as being related to teacher procedures, materials, or other aspects of the lesson. This is useful later when going through a large number of observation reports to pull out problems and suggestions for each of these areas.

Sample Reports

Figures 2, 3 and 4 are sample observation reports from current tryouts. The first two are from the Composition Skills Program, and the third one is from the Drama and Public Speaking Program. The writers of these reports generally did a good job of separating observations from inferences (although some prior training [and feedback] on this skill may be required initially).

After several observation reports have been submitted, it is useful to consolidate certain types of problems and revision suggestions. Figure 4 is a listing of inferences and implications across several reports which related to the handwriting exercises used in Level 1 (kindergarten) of the Composition Skills Program.

Fig. 2. Sample Report from Level 1 of Composition Skills Program

PROGRAM:	FIRST YEAR COMPOSITION SKILLS (KINDERGARTEN)...SPRING, 1972, Tryout		
DATE:	2/23/72	UNIT AND LESSON NO.:	Unit 1, Lesson 17
SCHOOL:	XXXX	LESSON DESCRIPTION:	Letter Formation Practice
TEACHER:	XXXX	SIZE AND LEVEL OF GROUP:	Entire Class (28) average
OBSERVER:	XXXX	TIME SPAN:	11:45-12:10 (about 6 children continued while the others joined the teacher in a circle)

OBSERVATION

The lesson is introduced as having two letters: "E's" and "W's." The teacher goes over the stroke sequences with all the children orally. As the teacher directs, the children "write" the letters in the sky, using their fingers. The teacher then uses an extra lesson sheet to write the letters for the children as they watch. The teacher says that when they are done, the children can do the pictures on each side of the lesson.

The children are instructed to put their names on their papers. "The 'W' is an upside-down 'M', so don't make your 'W' upside-down. Also, don't erase...just go on." The children work independently while the teacher goes around the room examining the letters, praising children who write good ones. She manually assists one girl whose "W's" look like chicken tracks (W). Most of the children are having trouble forming the "W" correctly.

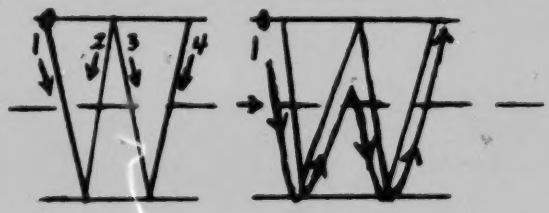
INFERENCES AND IMPLICATIONS
(Related to Teacher Procedures--TP, Material--M, Other--O)

O. The children worked extremely well on their own and enjoyed writing the letters.

O. The teacher referred to the lesson as having two letters: "E's" and "W's." Should she have said four letters: "E," "e," "W," and "w?"

O. The teacher said some of the children find letter formation impossible. The others (approximately 90%) enjoy it.

M. The children all had trouble with the "W." The teacher suggested that if the children did not have to lift their pencils for the stroke sequence, they could write the "W" much easier.



TP. Since the teacher gave the children no guidance regarding the second line of letters to be written without starting dots, the letters in that second line became scrambled with too many bunched up letters. The SWRL Teacher Procedures do not mention any guidance for that second line.

Fig. 3. Sample Report from Level 2 of the Composition Skills Program

PROGRAM:	SECOND YEAR COMPOSITION SKILLS (FIRST GRADE)...SPRING, 1972, Tryout		
DATE:	2/23/72	UNIT AND LESSON:	Story 26 ("The Fog") Story 10 ("Fun in the Sun")
SCHOOL:	XXXX	LESSON DESCRIPTION:	Word Selection
TEACHER:	XXXX	SIZE AND LEVEL OF GROUP:	(15) - above average (9) - below average
OBSERVER:	XXXX	TIME SPAN:	9:40-10:10 (still going on when I left)

OBSERVATION

All the children were gathered around the teacher, although two different lessons would be given. Story 26 ("The Fog") was presented to the class, and the teacher noted that this lesson didn't have any pictures. Therefore, after finishing the lesson, the children could draw their own pictures. Since the advanced group knew what to do, the teacher sent them to their seats with Story 26, asking them to work quietly.

The lower group remained to hear instructions for Story 10 ("Fun in the Sun"). The teacher whispered to me that this group has difficulty reading, and some of the children are on medication. Then the teacher had the children look at the picture on Page 1 and name the characters. She went through each sentence on Page 1, asking the children whether they would choose the top word or the bottom word and why. After reading the first sentence, she had different children read the rest on the front of the lesson. As the children went back to their seats, the teacher reminded them to look at the pictures since they help when doing the exercise. When they finished, the children could either color the pictures or come to the teacher and talk about the exercise. At this point, the teacher reminded the high group that they could choose several words from the lists in Story 26. (The low group did both sides of Story 10 at their seats.)

When the children finished their lessons, they came to the teacher who either marked errors in red and had the child correct the mistakes at his seat, or wrote "Very Good" if the lesson was correctly done. The teacher noted to those children doing Story 26 that it was fun to be able to choose their own words and make their own stories.

INFERENCES AND IMPLICATIONS
(Related to Teacher Procedures--TP, Material--M, Other--O)

TP. The teacher would like to have more than two groups, but she finds it impossible because of the time element. She sees no way to have three or four groups at three or four different levels, although the class

Fig. 3. (continued)

should be arranged in that manner. (The class has children in Book 6 all the way down to Book 1 in the Reading Program, with some children barely able to get through Book 1.)

M. In the sealed stack of Story 26, several Story 27 lessons were found.

TP. The way the teacher arranged the two groups was very clever. Since Story 10 was shorter than Story 26, the teacher helped the Story 10 children correct their papers and then let them color the pictures. Meanwhile, the Story 26 children finished their longer lesson and then went to the teacher for corrections. The timing seemed perfect, as all the children were busy and then finishing up at the same time.

Fig. 4. Sample Report from Level 3 of Drama and Public Speaking Program

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DRAMA & PUBLIC SPEAKING PROGRAM

Classroom Visitation

GRADE LEVEL:	2	OBSERVER:	XXXX
DATE:	March 9, 1972	SIZE OF GROUP:	Entire Class (approx. 30)
SCHOOL:	XXXX	TIME SPAN:	20 min.
TEACHER:	XXXX		

LESSON NO. AND DESCRIPTION: Lesson 10 -- The children practice saying first a single word and then script lines using many different tones of voice.

OBSERVATIONS

The teacher had all pupils sitting at their tables, a list of the emotion-words to be used written on the blackboard. She asked everyone to say the word "goodbye" using one of these (on the list) tones of voice. She selected volunteers (by raised hands) to go up before the class and say the word, having the class guess which emotion-word he was using. The volunteer would select children to guess his emotion-word. Most of the time the class was able to guess, but when they failed to, the teacher would ask the volunteer what his emotion was. Then, she would suggest and have the class suggest ways he could portray it. Then, the child would repeat his performance.

The teacher kept the pace very rapid, saying: "Hurry up now. Let's keep it moving." The children chose diversified emotions, rarely doing the same one in a row. If the children did have a "string" of performances of the same emotion, the teacher would ask the class to skip that one for awhile. If the children had difficulty in portraying an emotion (e.g., afraid) she would have several performers act as models, discussing what they could do to look "afraid." Then, she would have the performers who had trouble with "afraid" do it again. The teacher praised the good performances often.

INFERENCES and IMPLICATIONS

1. The teacher was very enthusiastic, and the rapid pace seemed to aid the lesson a good deal (she was like a good football coach). The rapid pacing kept the children from getting bored, since they are very quick learners.

Fig. 4. (continued)

2. The children seemed to enjoy the lesson very much. Everyone volunteered and no one seemed embarrassed if they made mistakes.

3. The teacher had gone over in detail the meanings of all the emotions (e.g., embarrassed, bored, confused) in a previous lesson and had discussed some stereotypic ways of portraying them. The children were able to elaborate on these and come up with some very imaginative gestures and facial expressions.

4. The children did follow the example of the better performers. Especially if the better performer did something amusing.

Fig. 5. Summary of Materials-related Inferences and Implications from Level 1 of Composition Skills

SPRING, 1972
COMPOSITION SKILLS PROGRAM

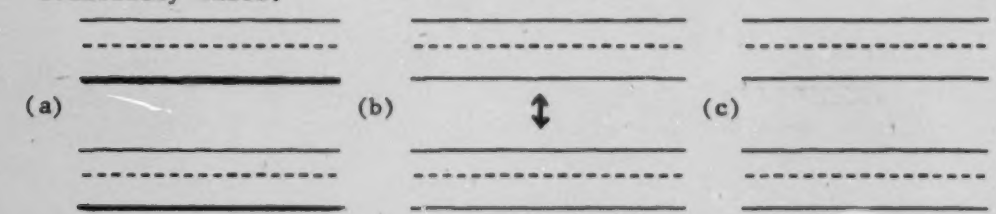
Observation in the Schools
Materials-Related Comments

Kindergarten

1. The 20 minutes allotted for each lesson is often not enough time to complete the entire exercise. Perhaps the exercise should consist of one letter (capital and lowercase) with space for continuation of that letter on the back of the exercise. Therefore, children who complete the front of the lesson can continue to practice on the back.

2. The dot on the small "i" is the same size as the starting dot and therefore confuses the children. They not only tend to start at the wrong place, but some children also made large circles for the dot rather than just a small dot.

3. Going from one guideline now to the next is a problem for the children. Several suggestions have been made to remedy the situation: (a) bottom lines of the guidelines should be darker than the others; (b) there should be a larger distance between each guideline set; (c) spaces between the guideline sets should be shaded and then eventually faded.



4. In some cases children hold their papers down with their left hand while writing with their right hand, and the left hand covers up the model letter.

5. The small "t" is a difficult letter regarding its starting height. Perhaps there should be an additional line within the guideline set between the top line and broken line:

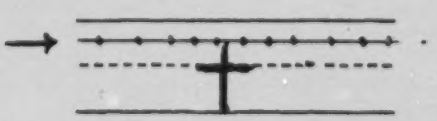
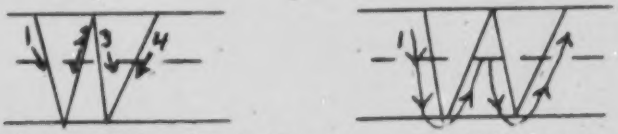
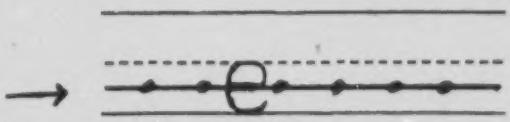


Fig. 5. (continued)

6. The "W" both capital and lowercase, is a difficult letter regarding the stroke sequence. Perhaps instead of four separate stroke sequences, the "W" should be made with one continuous stroke sequence:



7. The small "e" is extremely difficult, especially regarding placement in the guidelines. Perhaps there should be an additional line within the guideline set between the broken line and the bottom line:



(Perhaps the Teacher Procedures should include instructions on where to start the small "t" and the small "e.")

Working Paper 7

CLASSROOM TRYOUT OF A PROTOTYPE KINDERGARTEN HANDWRITING PROGRAM

Fred C. Niedermeyer and Ginny Supple

What types of activities, materials, and teaching procedures can schools use to develop beginning handwriting skills? Can kindergarten children benefit from systematic printing instruction, or should such instruction by delayed? Can children in low-income, inner-city schools learn to print as well and as early as children from middle-income, suburban schools? Can learning to print be made an enjoyable experience that will generate positive attitudes toward writing?

To answer these questions, research and development activities are being conducted at SWRL Educational Research and Development. The Laboratory is developing instructional systems in all areas of the elementary school curriculum. The handwriting instruction described here is part of a comprehensive Composition Skills Program for elementary schools.

Two outcomes were formulated for handwriting instruction: to print each capital and lower case letter of the alphabet and, to write the numerals 0 through 9. Various materials and procedures were developed and tried out in four kindergarten classes encompassing a wide range of socioeconomic and ethnic populations.

Instructional Materials

Letter Formation Exercises were developed to provide the children with initial instruction on each letter or numeral. Specifications for these exercises were obtained from a previous experimental study

of various strategies for teaching handwriting (Working Paper 3). For each Letter Formation Exercise, the children traced dotted representations of the letter 12 times and then copied the letter 12 times from a model at the top of the page. An incentive for completing the page was provided by placing an incomplete cartoon in the last response position. A dotted representation of the letter being practiced was imbedded in the cartoon. The cartoon was complete when the child traced the letter. Two letters (usually the capital and the lower case versions of a letter) or numerals were introduced in each Letter Formation Exercise. Thus each exercise contained a total of 48 responses and was designed to be administered during a 25 minute instructional period.

Other types of exercises were developed to provide additional practice in letter formation. Story Completion Exercises were developed in which children filled in blanks in sentences by copying model words. With assistance, the children could then read the "story" which described illustrations in the exercise. The stories were humorous, and were designed to help motivate the handwriting practice. Other exercises simply provided additional practice in copying letters or required the child write each letter as the teacher dictated it.

In all, the handwriting program consisted of 90 exercises, divided into five units of 18 exercises each. Each exercise was 25 minutes long. It was suggested that teachers devote approximately six weeks to each unit. By teaching three exercises a week, a unit could be completed in six weeks. The exercises were sequenced according to difficulty of letter formation. Straight-line letters

such as t or l were taught first. Curved-line letters and numerals came later. A Teacher's Guide was provided which listed instructional procedures for the teacher. Generally, the procedures emphasized a positive approach with the children. For example, when helping children form letters with proper stroke sequence and direction, teachers were asked to say something like, "This letter is good. Try to make some that are even better."

METHOD

To determine how well the program would operate in a variety of school settings, two schools in each of four areas were identified: low-income Spanish-speaking inner city, low-income Black inner city, lower-middle-income White suburban. Each area was represented by a different school district. Within each district, one class in one school was designated as a tryout class and one class in the other school a comparison class.

Laboratory staff conducted one hour teacher training sessions at each tryout school. At this time teachers were given materials and a copy of the Teacher's Guide. The outcomes and the materials comprising the program were described and examined, and teaching procedures were presented and discussed. Comparison classes simply received normal kindergarten instruction during the year.

Before the tryout, the eight kindergarten classes (four tryout and four comparison) were administered a handwriting pretest. At the end of the school year, the eight classes were administered an alternate form as a posttest. Laboratory staff members administered both

tests. On each test, children were asked to copy a total of 10 letters and numerals. The letters and the numerals on each test were selected to represent the range of difficulty across the 52 letters (26 upper case and 26 lower case) and 10 numerals.

Each letter printed by a child on the pretest or the posttest was scored on a 6-point legibility scale. Ratings ranged from 0 (no response) to 5 (very legible). Model letters for each point in the scale were provided, and the average correlation of agreement for ratings of three judges who had no knowledge of treatment conditions were .91 on the pretest and .89 on the posttest.

To assess the children's attitudes toward the handwriting instruction, a total of 40 kindergarten children (five randomly sampled from each of the eight classes) were individually interviewed by Laboratory staff at the end of the year. Interviewers used a six-item pupil preference inventory. Each child was asked to state whether he liked various activities "a whole lot," "a lot," "just o.k.," or "not at all." Three of the items related to general writing activities (printing letters, writing his name, copying words the teacher writes) and three related to non-writing activities (listening at "sharing," reading stories, coloring or painting). To compare the responses of the children in the tryout and in the comparison classes, each item was scored by assigning a numeral ranging from 1 ("not at all") to 4 ("a whole lot"). For each child in the tryout and the comparison classes, a mean score for the three writing items and a mean score for the three non-writing items were computed.

In addition to the pretest, the posttest, and the pupil preference inventory, other sources of data for the study included Laboratory observations of a total of 13 lessons in the tryout classes and teachers' comments obtained at an end-of-year meeting.

RESULTS

Table 1 presents the distribution of pretest and posttest ratings on letters and numerals for the kindergarten tryout classes and the comparison classes. The distribution of ratings is reported in percentage. Cumulative distributions for each testing are reported in parentheses. As Table 1 shows, 47% of the pretest ratings for the comparison classes ranged from 3 through 5 (fairly legible or better), while only 23% of the pretest ratings for the tryout classes fell in this range. On the posttest, however, 90% of the ratings for the tryout classes were 3 or higher, compared with 72% for the comparison classes.

When broken down by schools, the posttest data indicated consistently high performance in the tryout schools. The percents of posttest responses rated 3 or higher for the tryout classes in Districts A, B, C, and D were 95, 83, 86, and 96. respectively. In the corresponding four comparison classes, the percents were 54, 86, 75, and 74, respectively. Only in District B was the percentage of ratings 3 or higher not appreciably different between the comparison school and the tryout school. However, 61% of the pretest ratings for the comparison school in District B were 3 or higher, as compared with only 2% for the tryout school.

TABLE 1

PRETEST AND POSTTEST PERCENTAGE DISTRIBUTION OF RATINGS FOR KINDERGARTEN TRYOUT AND COMPARISON CLASSES ON LETTER COPYING ITEMS

Ratings	Tryout Children		Comparison Children	
	Pretest	Posttest	Pretest	Posttest
5 (very legible)	0 (0)	8 (8)	0 (0)	2 (2)
4 (quite legible)	4 (4)	23 (31)	12 (12)	12 (14)
3 (fairly legible)	19 (23)	59 (90)	35 (47)	58 (72)
2 (barely legible)	47 (70)	7 (97)	38 (85)	19 (91)
1 (completely illegible)	15 (85)	3 (100)	10 (95)	6 (97)
0 (no response)	15 (100)	0 (100)	5 (100)	3 (100)
Number of subjects:	40	40	40	40
Total number of letter responses rated:	400	800	400	800

Note: Cumulative percentages are in parentheses.

Table 2 reports the mean ratings and the standard deviations on the pupil preference inventory for the writing and non-writing activities of the tryout classes and the comparison classes. The mean ratings for the tryout classes and the comparison classes on the non-writing items were identical, and would be expected. However, the children in the tryout class rated writing activities significantly more positively than children in the comparison classes ($p<.05$).

TABLE 2

MEAN RATINGS AND STANDARD DEVIATIONS ON THE PUPIL PREFERENCE INVENTORIES FOR WRITING AND NON-WRITING ACTIVITIES OF TRYOUT AND COMPARISON CHILDREN

Group	Number of Pupils	Writing Items			Non-Writing Items		
		Mean	Standard Deviation	t	Mean	Standard Deviation	t
Tryout	20	2.8	.66	2.3 $p<.05$	3.0	.71	0.5 $p<.05$
Comparison	15	2.4	.46		3.0	.53	

Lesson observations and teacher meetings yielded much information on use of the program in kindergarten level. Generally, all four tryout teachers felt that the program was appropriate for most of the children and that the exercises were generally geared to the children's interests. The teachers rated the children's overall reaction to the program as very enthusiastic. All the teachers said that they would use the program again.

IMPLICATIONS

The results of this study shed some light on beginning handwriting instruction:

- Systematically developed and sequenced materials can effectively promote beginning printing skills. These materials must provide children with substantial amounts of direct practice on the printing task. Teachers should provide direct, positive feedback to individual children as they practice letter formation.
- Kindergarten children can effectively learn to print. There appears to be no reason to delay systematic printing instruction until later.
- There seems to be no large difference in how well children of various socioeconmic levels and ethnic groups learn to print in kindergarten.
- Systematic instruction which provides for learner success in printing can generate positive attitudes toward school activities involving handwriting in kindergarten.

The instructional program described in this study can be replicated. That is, the instructional materials, activities, and procedures are in a format that is usable by others. Also, the program has been validated in actual classrooms. That is, it has demonstrated its effectiveness in promoting specified handwriting skills. The continued development of such programs in other subject areas promises to help teachers improve the basic skill abilities of your children.

Working Paper 8

1971-72 TRYOUT OF THE LEVEL 2 COMPOSITION SKILLS EXERCISES (TN 3-72-35)

Lee Trithart, Edys Quellmalz, and Fred Niedermeyer

Level 2 of the SWRL Composition Skills Program is normally used in first grade and is designed to be coordinate with the SWRL Second-Year Reading Program. Initial formulation of the program began during the Fall of 1969. The first tryout took place in 14 classes during the last five months of the 1969-70 school year, and provided extensive performance data demonstrating the effectiveness of the program (Sullivan, Okada, and Niedermeyer, 1971). On the basis of the initial tryout, revisions were incorporated into the program and the second tryout occurred in the 1970-71 school year in an additional 14 classes. Evaluation of this tryout was limited to teacher feedback concerning the program revisions (Okada and Baker, 1971). After routine editing the materials were again tried out during the 1971-72 school year in eight first grade classes encompassing a wide range of school locations and conditions. This report describes the Level 2 program, the tryout procedures, and the results. A discussion of the results and a listing of revisions are also included.

METHOD

Outcomes

Level 2 of the SWRL Composition Skills Program was designed to teach the following skill areas of composition writing:

WRITES

1. with increasing fluency
2. good, interesting, well-expressed stories

EDITS compositions for

3. appropriate word spacing
4. word omissions
5. sentence-initial capitalization
6. capitalization of proper names
7. sentence-final punctuation

Materials

To achieve the program outcomes instruction was presented in a series of 64 sequenced writing lessons that presented progressively less structured writing formats and required children to write with increasing fluency. Each of the 64 lessons was developed to coordinate with one of the 64 fiction stories of the SWRL Second-Year Reading Program. Both sets of lessons were based on identical reading vocabulary. Plots, characters, and story sequences in the two programs were unrelated.

Composition Skills lessons were presented in the form of a story with accompanying pictures. The stories were incomplete in that the sequence of lesson formats required students to write progressively more words and sentences to successfully complete the stories. Initial exercises had one or more words missing from the sentences of the story and required the student to select the most appropriate word or words to complete the sentences from among given choices. Later exercises required children to supply their own words and phrases to complete the sentences of the story. For these and subsequent lessons, SWRL Word List Booklets containing the words from the Reading Program in an alphabetized list accompanied the standard lesson materials to facilitate spelling and variety of word usage. In later lessons one or more

sentences were gradually deleted from the story text so that lengthier and more complex responses were required to complete the story. The final exercises in the program consisted of a sequence of four illustrations and required the children to write the entire story accompanying the illustrations.

The exercises were designed to require a minimum of teacher supervision once a new lesson format or outcome was introduced. Specific teaching procedures were written on each exercise. In addition to these directions for specific lessons, teachers received a Teacher's Guide that described materials, general teaching and follow-up procedures, SWRL tryout requirements, and a description of the coordination between the Reading Program Fiction Stories and the Composition Skills Exercises.

Sample

Level 2 of the Composition Skills Program was tried out in a total of eight first-grade classes. To determine how well the program would operate in a variety of school settings, the tryout schools were selected to represent a wide range of socio-economic and minority-group populations. The chart below indicates the distribution of the classes according to school, district, socio-economic level, and predominant ethnic composition. All classes using the Level 2 Composition Skills Program were also using the Second-Year Reading Program.

District*	Number of Classes	Socio-Economic Level	Predominant Ethnic Composition
A	2	upper-middle-income suburban	White
B	2	lower-middle-income suburban	White
C	1	lower-income inner-city	Mexican-American
D	3	lower-income inner-city	Black

*one school per district

For each of the four tryout schools a class in a comparison school was designated. Comparison schools were similar to tryout schools on the basis of socio-economic level, ethnic composition, size, and geographic location.

Procedures

Prior to the initiation of the Program, teacher training sessions lasting approximately 45 minutes were conducted at each school by the Laboratory staff. Teachers were given materials and Teacher's Guides at this time. The outcomes and materials of the program were described and examined, and teaching procedures were presented and discussed.

Teacher-training sessions took place during late October of 1971. Teachers were to begin the first Composition Skills exercises when their classes reached Book 1 Story 1 of the Second-Year Reading Program. Pacing of Composition Skills lessons was contingent upon the scheduling of Reading lessons. The rate required for completion of the Program was two lessons in each program per week. Additionally, 25 minutes

of instructional time plus 5-10 minutes of follow-up time was to be allotted for each Composition Skills Program lesson.

Data Sources and Testing Procedures

Pupil Performance Tests. In late October and early November the eight tryout and four comparison classes were pretested. In late May the same 12 classes were posttested. All testing was conducted by SWRL staff members.

Pre- and posttests were in two parts: the first part required students to write five sentences from dictation and the second part required them to write a composition in response to directions and an illustration. Dictated sentences were designed to elicit use of the full range of editing outcomes (punctuation and capitalization skills) from students. The pictures and directions accompanying the composition task were designed to elicit a story containing both narration and dialogue. Children were given 15 minutes in which to plan and write their stories and were given five minutes for editing what they had written. Pre- and posttest sentence dictation and comparison items were drawn from the same item pools. A copy of the pretest and of the instructions used by the test administrator can be inspected in Niedermeyer, Quellmalz, and Trithart, 1972. A copy of the posttest procedures used by the test administrator is contained in Appendix A.

Sentences dictated were scored for word spacing, sentence completeness, capitalization, and ending punctuation using procedures established during a previous study (Labeaune, Niedermeyer, and Sullivan, 1971). Stories written by the children were analyzed for

writing fluency and sentence correctness by simply counting words and sentences, procedures also previously established (Labeaune, et al., 1971). Story quality was assessed by three types of subjective ratings on six-point scales: (1) overall quality, (2) originality, and (3) organization, using procedures established during a previous study (Niedermeyer, et al., 1972). The agreement correlation between two SWRL staff members scoring a sample of 15 pretest compositions was .89 for overall quality, .91 for originality, and .88 for organization. The agreement between three staff members scoring a sample of 15 posttest compositions was .91 for overall quality, .87 for originality, and .86 for organization. In addition, stories received a classification according to type of organization using procedures previously established (Niedermeyer, et al., 1972). Stories were categorized as organized according to chronology, space, plot, argument, or other criteria, or as a no response. The agreement correlation between two SWRL staff members classifying a sample of 15 pretest compositions was .89. The agreement between three raters classifying a sample of 15 posttest compositions was .87.

Because the test-scoring procedures for Levels 1, 2, and 3 of the Composition Skills Program involved a considerable amount of staff time, random samples of ten children from each tryout and comparison class in each district were selected for analysis. Thus the sample of first-grade students whose composition skills were analyzed consisted of 80 children (ten children randomly selected from each of the tryout and control groups in each of the four classes) on pretest and posttest. To insure

that raters had no knowledge of tryout and comparison classes, tests were coded and randomly sequenced prior to scoring.

Pupil Preference Inventories. A random sample of 38 tryout and 20 comparison group children (five from each of the tryout and comparison classes in each of the four districts) was interviewed by SWRL staff members, using the tryout or comparison group Pupil Preference Inventory. Each child was interviewed individually and asked to state whether he liked various activities "a whole lot," "a lot," "just o.k.," or "not at all." Eight of the items (five related to general writing activities and three related to non-writing activities) were identical on the tryout and control inventories. Four additional questions appeared only on the tryout inventory and concerned specific types of lessons in the Level 2 Program.

Lesson Observations. During the tryout, classroom lessons were observed by staff members on a regular basis. Procedures for systematically documenting these observations were operationalized (Niedermeyer, 1972). Essentially these procedures required the observer to write a summary of all that was seen and heard during the lesson, following each observation. Inferences about pupil attitudes and teacher performance, and implications for program materials and procedures were then recorded on the report form. In all 22 lessons were observed and documented at the first-grade level.

Teacher Questionnaires. Letters were sent to all the Level 2 teachers near the end of the school year (late May) thanking them for their participation in the program and requesting them to fill out the

Teacher Questionnaire for program evaluation. The questionnaire was designed to elicit specific comments, criticisms, revision suggestions, and teacher attitudes toward the program. A copy of the questionnaire which shows the responses of the six teachers who completed their questionnaires is contained in Appendix B.

RESULTS

Scores presented in this section have been summed across the four districts tested. However, for Tables 1-5 in this section, corresponding tables showing the data arrayed by district may be found in Appendix C.

Pupil Performance

Table 1 presents the pretest and posttest percentages of correct responses on editing outcomes (Outcomes 3-7, Page 2) as measured through the sentences dictated to the first grade tryout and comparison classes. From the data in Table 1 it may be seen that the percentage of correct responses on each editing outcome was higher for tryout classes on posttest dictated sentences than it was for comparison classes.

Table 2 indicates pretest and posttest means and standard deviations of total words and sentences in stories written by first-grade tryout and comparison classes (Outcome 1). As may be seen, tryout children progressed from an initially lower mean number of words per composition, 4.22 as compared with 9.85, to a higher mean number of words per composition on the posttest, 31.77 as compared with 23.78. On the number of sentences written per composition, the tryout classes likewise progressed from an initially lower mean, .65 as compared with 1.20, to a

TABLE 1

PERCENTAGES OF CORRECT RESPONSES ON EDITING OUTCOMES
AS MEASURED THROUGH DICTATED SENTENCES

Outcome Measured	Tryout Classes		Comparison Classes	
	Pretest	Posttest	Pretest	Posttest
3. Spacing: All words present discernible as distinct units	42	77	42	58
4. Sentence complete: All words present	51	93	43	63
5. Initial Capitalization: Correctly capitalizes initial letter of sentence	44	72	35	60
6. Capitalization: Correctly capitalizes proper names	10	65	5	19
7. Ending Punctuation: Correct ending punctuation	6	47	5	20
Number of subjects	40	40	40	40

Number of items responded to by each subject on each editing outcome: sentence complete, 5; spacing, 5; initial capitalization, 5; capitalization of proper names, 2; ending punctuation, 5.

TABLE 2

MEANS AND STANDARD DEVIATIONS OF TOTAL WORDS AND SENTENCES IN STORIES

Outcome Measured		Tryout Classes		Comparison Classes	
		Pretest	Posttest	Pretest	Posttest
1. Number of Words	$\bar{X}$	4.22	31.77	9.85	23.78
	s.d.	5.48	22.49	9.40	23.21
1. Number of Sentences	$\bar{X}$	.65	2.90	1.20	2.70
	s.d.	.80	2.31	1.11	3.65
number of subjects		40	40	40	40

slightly higher posttest mean, 2.90 as compared with 2.70.

Table 3 shows pretest and posttest percentages of complete sentences, sentence strings, sentence fragments, and run-on sentences in stories written by first-grade tryout and comparison classes (Outcomes 4, 5, and 7). This table differs from Table 1 in that the outcomes were assessed in a constructed-response, story context, rather than in dictated sentences. There is very little difference between the two groups when employing these outcomes in a story context.

Table 4 contains the pretest and posttest cumulative percentages of subjective ratings of quality, originality, and organization of the stories written by the first-grade tryout and comparison classes (Outcome 2). The principle differences in the two groups are that (1) there were no posttest tryout students who did not attempt to respond to the composition task, whereas 25 percent of the comparison students wrote nothing, and (2) on ratings of overall quality, originality, and organization, a consistently higher percentage of posttest tryout students (53, 72, and 54 percent respectively) wrote compositions in the "3" through "5" range (fair or better) than did students in the posttest comparison group, for whom the figures were 35, 47, and 35 percent.

In Table 5 the pretest and posttest percentages of types of organization in stories written by the first-grade tryout and comparison classes may be seen (Outcome 2). Corresponding figures are approximately the same for the two groups with the exception of the higher percentage of posttest tryout students, 75 percent, who wrote compositions

TABLE 3

PERCENTAGES OF COMPLETE SENTENCES, SENTENCE STRINGS, SENTENCE FRAGMENTS, AND RUN-ON SENTENCES

		Tryout Classes		Comparison Classes	
	Outcome Measured	Pretest	Posttest	Pretest	Posttest
4.	Complete Sentences	46	65	44	70
5., 7.	Sentence Strings	0	3	2	0
4.	Sentence Fragments	38	14	37	12
5., 7.	Run-On Sentences	16	18	17	18
	number of subjects	40	40	40	40

TABLE 4

CUMULATIVE PERCENTAGES OF SUBJECTIVE RATINGS OF QUALITY, ORIGINALITY, AND ORGANIZATION OF STORIES

	Tryout Classes						Comparison Classes					
	Pretest			Posttest			Pretest			Posttest		
	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization
Excellent	0	0	0	0	0	0	0	0	0	0	5	0
Good	0	0	0	5	42	22	0	0	0	5	32	7
Fair	5	0	0	53	72	54	0	2	5	35	47	35
Somewhat Inadequate	17	15	15	88	92	72	28	20	20	55	65	53
Extremely Inadequate	35	33	33	100	100	100	60	52	55	75	75	75
No Response	100	100	100	100	100	100	100	100	100	100	100	100
Number of Ss	40	40	40	40	40	40	40	40	40	40	40	40
Coefficient of agreement	.89	.91	.88	.91	.87	.86	.89	.91	.88	.91	.87	.86

TABLE 5

PERCENTAGES OF TYPES OF ORGANIZATION IN STORIES

	Tryout Classes		Comparison Classes	
	Pretest	Posttest	Pretest	Posttest
Chronological	12	75	23	48
Spatial	0	0	0	0
Plot	0	0	0	2
Arguemnt	2	0	2	0
Other	18	25	30	25
No Response	68	0	45	25
number of subjects	40	40	40	40
Coefficient of agreement	.92	.87	.92	.87

chronologically organized compared with 48 percent of the posttest comparison students. The difference in the percentages of posttest tryout and comparison students in the "No Response" classification has already been noted.

Pupil Preferences

Tables 6 and 7 display the percentage distributions for how well the tryout and comparison children stated they liked various activities on the Pupil Preference Inventory. As may be seen from examination of corresponding items in the two tables, the tryout classes evidenced a generally more positive attitude toward all school activities, writing and non-writing, than did the comparison classes. The tryout classes also showed a high degree of preference for activities related to the specific materials in the Level 2 Program (Items 2, 5, 8, and 11).

Lesson Observations and Teacher Questionnaires

Lesson observations and teacher questionnaires yielded much information concerning use of the Level 2 Program at the first-grade level. This information is summarized below according to various categories.

Pacing. The percents of participating tryout students having completed different portions of the Level 2 Composition Skills Program may be seen in Table 8. Forty-five percent of the participating students in the tryout classes had completed the program or were working within the last eight lessons. An additional 55 percent were still working at different stages. Fifteen percent of the students in the tryout classes were non-participants. Since lessons were suggested for scheduling at the rate of two per week, students who were not

TABLE 6

PERCENTAGE DISTRIBUTION OF PUPIL PREFERENCE INVENTORY RESPONSES

	In school this year did you ever..?		Do you like to..?		Do you like it..?		
	yes	no	yes	no	a whole lot	a lot	just o.k.
1. write words?	100	0	100	0	24	42	34
2. write words that fit into sentences like these? (Show Stories 5 & 12.)	97	3	100	0	38	38	24
3. listen to other boys and girls share things they've brought to school?	97	3	97	3	50	36	14
4. write sentences?	97	3	97	3	38	31	31
5. choose words and write them in the numbered spaces like these? (Show Stories 17 & 26.)	89	11	100	0	44	21	35
6. read stories?	100	0	97	3	43	30	27
7. write a story that tells about a picture?	89	11	94	6	44	28	28
8. write your own words in spaces to finish sentences like these? (Show Stories 35 & 44.)	92	8	97	3	42	29	29
9. draw pictures with crayons or paint?	95	5	100	0	69	20	11
10. make up titles for the stories you write?	87	13	94	6	42	23	35
11. write stories on papers like this? (Show Stories 61 & 64.)	66	34	96	4	33	17	50
12. write your name?	100	0	100	0	55	13	32

TABLE 7

PERCENTAGE DISTRIBUTION OF PUPIL PREFERENCE INVENTORY RESPONSES
BY 20 RANDOMLY-SAMPLED FIRST-GRADE CHILDREN IN FOUR COMPARISON CLASSES

	In school this year did you ever..?		Do you like to..?		Do you like it..?		
	yes	no	yes	no	a whole lot	a lot	just o.k.
1. write words?	100	0	95	5	5	32	63
2. listen to other boys and girls share things they've brought to school?	95	5	95	5	22	45	33
3. write sentences?	90	10	100	0	17	44	39
4. read stories?	85	15	100	0	24	35	41
5. write a story that tells about a picture?	90	10	94	6	18	35	47
6. draw pictures with crayons or paint?	100	0	90	10	39	44	17
7. make up titles for the stories you write?	75	25	100	0	27	46	27
8. write your name?	100	0	100	0	20	35	45

TABLE 8

PERCENTS OF PARTICIPATING STUDENTS IN TRYOUT CLASSES HAVING COMPLETED DIFFERENT PORTIONS OF THE LEVEL 2 COMPOSITION SKILLS PROGRAM

Number of Lessons	Percents of Pupils Completing
57-64	45
49-56	29
41-48	7
33-40	14
25-32	5
17-24	0
9-16	0
1-8	0

Note: Fifteen percent of the students in the tryout classes were non-participants in the program.

working within the last block of lessons appeared unlikely to complete the entire program by the time of the posttest.

Teacher Affect. Five of the six teacher questionnaire respondents felt that the program was appropriate for most of their children. All felt that the exercises were generally geared to the children's interests and rated the children's overall reaction to the program as fairly to very enthusiastic. All of the teachers stated thay would use the program again.

Time per Lesson. All teachers stated that lessons took less than 25 minutes with one teacher using less than an average of 15 minutes per lesson. In general it appeared that the time taken per lesson diminished as children progressed through the program until the final lessons in which length of time was controlled by how much and how long the children wanted to write.

Teacher's Guide. Four of the six respondents felt that the teacher directions for each lesson were clear and helpful as was the Teacher's Guide itself. The other two respondents stated that they had used neither the directions specific to each lesson nor the Teacher's Guide.

DISCUSSION AND REVISIONS

The pupil performance data on editing outcomes (Outcomes 3-7) indicated that the exercises were fairly successful in teaching most of the skills assessed when they occurred in the context of a single-sentence response as in the sentence-dictation data (Table 1). However, when students were required to edit for outcomes 4, 5, and 7 in responses

longer than a single sentence in length, as in their posttest stories (Table 3), there was no difference between the performance of students in tryout and comparison classes. This may be due in part to two facts: 1) direct instruction on the correction of run-on sentences, sentence fragments, and sentence strings was not presented, and 2) the lessons most directly applicable to the practice of this skill, i.e. those requiring the student to write responses longer than a single sentence in length and then to proofread his writing, did not occur until relatively late in the program, after Lesson 55. (There are 64 lessons in the program.) Only 45 percent of the students tested reached these lessons.

The data on the average number of words and sentences written by tryout students in their posttest compositions (Outcome 1, Table 2) also appears to have been affected by the fact that more than half of the tryout students tested had not completed the program. Although writing fluency was promoted throughout the program, the posttest composition task required multiple-sentence responses comparable only to the responses required in the program after Lesson 55. The ability of tryout students to write longer posttest compositions than did the students in comparison classes is evidence of the efficacy of the fluency instruction throughout the program. However the failure of 55 percent of the students tested to reach lessons giving instruction on composing multiple sentences is reflected in the poor performance of students in this tryout (32 words, 2.9 sentences per composition) when compared with that of students in previous tryouts (71 words, 9.1 sentences per composition) for whom the average proportions of the

program completed were greater.

The superior achievement by the tryout students on ratings of overall quality, originality, and organization (Outcome 2, Table 4) and the larger percentage of them using recognizable criteria for organizing their stories (Outcome 2, Table 5) may be assumed to be largely an incidental effect of the instruction on fluency and technical accuracy. These global outcomes received very little direct instructional attention. It would appear that although students may possess competencies in the fields of originality or organization, it is impossible to accurately assess their ability as applied to story writing until a minimal level of writing fluency has been achieved. Once students are writing compositions at least several sentences in length, it becomes possible to assess existing abilities and to begin instruction to perfect them.

The data provided by the 1971-72 tryout of the SWRL Level 2 Composition Skills Program corroborated the data from preceding tryouts concerning the overall effectiveness of the program and provided additional data for program revision. On the basis of the data collected during this tryout the following program revisions will be made:

1) The sequence of 64 stories will be revised and organized into five units containing 12 lessons each, the last lesson in each unit being a progress check designed to identify students who have not mastered the outcomes introduced in the unit. Teachers will be instructed to give students having

difficulty with selected outcomes additional practice on the outcomes.

2) Editing outcomes will be introduced more explicity and opportunities for practice more systematically provided according to detailed lesson specifications.
3) The sequence for promoting fluency will follow the same progression but will be accelerated so that instruction requiring multiple-sentence responses will begin by Lesson 42.
4) Units 4 and 5 will provide explicit instructional emphasis on planning and organization.
5) The Teacher's Guide and instructional procedures have been revised to reflect the above program revisions.

In addition, use of the SWRL Composition Skills Program will be made independent of any specific reading program. The Program will be rewritten to be coordinate with the SWRL Reading Program word base. Composition Skills Program story plots and characters will continue to be exclusive to the program.

APPENDIX A

PROCEDURES USED BY TEST ADMINISTRATOR

FORM 2

FIRST GRADE COMPOSITION SKILLS TEST

PART I

Directions:

-Give each child a pencil and answer sheet.
-Tell the children that they are going to practice writing.
-Ask each child to put his name on his answer sheet.
-Tell the children that you are going to read them some sentences.
-Explain that they should try to write the sentences as you read them.
-Tell the children that they should try to write and spell each word as best they can.
-Ask the children to listen carefully, as you will say each sentence only two times.
-Begin reading each sentence. Say the words slowly once. Wait about 5 seconds, then repeat the sentence.
-Check that the children are writing on the appropriate line.

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1. She fell.
2. He is Sam.
3. Is she sad?
4. I sat on the hill.
5. Will Nat win?

PART II

Directions:

-Ask the children to turn to the next page.
-Explain that they are going to write a story about the picture at the top of the page.
-Read the following introduction to the children. Do not elaborate on this introduction.

> Ann and Bud appear to be going away. Write a story about where they are going, what they will do once they get there, and why they seem to be so happy. Include some things that Ann and Bud say to each other while in the car.

-Point out the first line and explain that they should write the title of their story on it before they begin actually writing the story.
-After 15 minutes tell the children to stop. Read them the following directions:

> Stop writing.
> Go back and read your story to yourself. If you find mistakes, change them to make them right.

-Wait 3 minutes, and then collect all the papers.

APPENDIX B

SWRL SECOND-YEAR COMPOSITION SKILLS PROGRAM

Spring, 1972

TEACHER QUESTIONNAIRE

The SWRL Second-Year Composition Skills Program is still being developed and refined. In order that we may evaluate and further improve the program, it is essential that we obtain your comments, criticisms, and suggestions with this questionnaire. Thank you.

1. Please indicate the last exercise completed by your children. (If your children were not grouped, please complete Group 1 only.)
   Group 1: 7-23 children; Story 50-64
   Group 2: 2-9 children; Story 39-64
   Group 3: 5-9 children; Story 25-50
   Group 4: 8 children; Story 38
   Non-participants: 6-17 children

2. Is the program appropriate for most of your children?
   5 yes 1 no

3. What was the overall reaction of your class to the program?
   4 very enthusiastic
   2 fairly enthusiastic
   ____ neutral
   ____ fairly unenthusiastic
   ____ very unenthusiastic

4. How long was each lesson, on the average?
   1 less than 15 minutes
   5 15 to 25 minutes
   ____ 25 to 35 minutes
   ____ more than 35 minutes

5. Were the teacher directions for each exercise clear and helpful to administering the lessons?
   4 yes ____ no 2 did not use

6. Was the Teacher's Guide clear and complete?
   4 yes ____ no 2 did not use

7. Were the stories generally enjoyable and interesting to the children?
   6 yes _____ no

8. What proportion of your class was able to complete most of the lessons independently?
   5 more than 80%
   1 60% to 80%
   _____ 40% to 60%
   _____ 20% to 40%
   _____ less than 20%

9. Would you use the program again?
   6 yes _____ no

10. Please write below specific comments, criticisms, or suggestions not already covered. You may want to comment on individual exercises, the sequence of the exercises, illustrations, or specific problems you encountered.

APPENDIX C

Table 1a. Pretest and Posttest Percentage Distribution of Correct Responses on Editing Outcomes as Measured Through Dictated Sentences for First-Grade Tryout and Comparison Classes in Four School Districts

Outcome Measured	District A*				District B				District C				District D			
	Tryout		Comparison		Tryout		Comparison		Tryout		Comparison		Tryout		Comparison	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
3. Spacing	90	80	82	88	46	92	68	88	30	68	0	16	0	66	18	42
4. Sentence Complete	94	100	78	96	56	100	64	98	38	100	0	20	16	70	28	38
5. Initial Capitalization: Sentences	68	74	60	68	50	98	36	84	28	68	0	36	30	50	42	54
6. Capitalization: Proper Names	65	85	30	35	15	90	15	20	67	55	0	0	0	12	0	8
7. Ending Punctuation	20	68	18	34	0	66	0	46	0	54	0	0	1	0	0	0
Number of subjects	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

Number of items responded to by each subject on each editing outcome: sentence complete, 5; spacing, 5; initial capitalization, 5; capitalization of proper names, 2; ending punctuation, 5.

*A = white upper-middle-income suburban
B = white lower-middle-income suburban
C = bilingual (Spanish-English) lower-income inner-city
D = black lower-income inner-city

Table 2a. Pretest and Posttest Means and Standard Deviations of Total Words and Sentences in Stories Written by First-Grade Tryout and Comparison Classes in Four School Districts

	Outcome Measured		District A*				District B				District C				District D			
			Tryout		Comparison		Tryout		Comparison		Tryout		Comparison		Tryout		Comparison	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1.	Number of Words	$\bar{X}$	11.70	25.60	12.60	33.90	2.50	34.10	20.90	47.60	1.10	53.00	0.00	0.00	1.60	14.40	5.90	13.60
		s.d.	3.77	9.15	7.24	14.84	3.07	12.48	4.72	21.63	1.64	30.01	0.00	0.00	3.90	6.10	5.22	8.55
1.	Number of Sentences	$\bar{X}$	1.50	3.00	1.60	3.60	.50	5.20	1.50	5.20	.40	2.10	0.00	0.00	.20	1.30	1.70	2.00
		s.d.	.92	1.26	.66	2.46	.50	2.93	.92	5.42	.49	1.30	0.00	0.00	.40	.64	1.27	1.34
	number of subjects		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

*A = white upper-middle-income suburban
B = white lower-middle-income suburban
C = bilingual (Spanish-English) lower-income inner-city
D = black lower-income inner-city

Table 3a. Pretest and Posttest Percentages of Complete Sentences, Sentence Strings, Sentence Fragments, and Run-On Sentences in Stories Written by First-Grade Tryout and Comparison Classes in Four School Districts

Outcome Measured	District A*				District B				District C				District D			
	Tryout		Comparison		Tryout		Comparison		Tryout		Comparison		Tryout		Comparison	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
4. Complete Sentences	60	77	67	67	60	71	27	81	0	38	0	0	0	38	35	50
5., 7. Sentence Strings	0	0	0	0	0	0	7	0	0	14	0	0	0	0	0	0
4. Sentence Fragments	20	0	19	3	40	19	33	8	100	19	0	0	50	15	59	40
5., 7. Run-On Sentences	20	23	12	31	0	4	33	12	0	29	0	0	50	46	6	10
number of subjects	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

*A = white upper-middle-income suburban
B = white lower-middle-income suburban
C = bilingual (Spanish-English) lower-income inner-city
D = black lower-income inner-city

Table 4a. Pretest and Posttest Percentage Distribution of Subjective Ratings of Quality, Originality and Organization of Stories Written by First-Grade Tryout and Comparison Classes in a White Upper-Middle-Income Suburban District

Ratings	Tryout						Comparison					
	Pretest			Posttest			Pretest			Posttest		
	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization
5 Excellent	0	0	0	0	0	0	0	0	0	0	10	0
4 Good	0	0	0	20	50	30	0	0	0	10	60	10
3 Fair	0	0	0	50	40	50	0	10	20	50	20	60
2 Somewhat Inadequate	50	40	60	30	0	0	70	40	20	30	0	30
1 Extremely Inadequate	40	50	30	0	10	20	20	30	50	10	10	0
0 No Response	10	10	10	0	0	0	10	20	10	0	0	0
number of Ss	10	10	10	10	10	10	10	10	10	10	10	10
coefficient of agreement	.89	.91	.88	.91	.87	.86	.89	.91	.88	.91	.87	.86

Table 4a. Pretest and Posttest Percentage Distribution of Subjective Ratings of Quality, Originality and Organization of Stories Written by First-Grade Tryout and Comparison Classes in a White Lower-Middle-Income Suburban District

Ratings	Tryout						Comparison					
	Pretest			Posttest			Pretest			Posttest		
	Overall Quality	Origihality	Organiza-tion	Overall Quality	Originality	Organiza-tion	Overall Quality	Originality	Organiza-tion	Overall Quality	Originality	Organiza-tion
5 Excellent	0	0	0	0	0	0	0	0	0	0	10	0
4 Good	0	0	0	0	30	30	0	0	0	10	40	20
3 Fair	20	0	0	70	50	30	0	0	0	60	30	30
2 Somewhat Inadequate	0	20	0	30	20	40	40	30	40	10	20	30
1 Extremely Inadequate	10	10	30	0	0	0	50	60	50	20	0	20
0 No Response	70	70	70	0	0	0	10	10	10	0	0	0
number of Ss	10	10	10	10	10	10	10	10	10	10	10	10
coefficient of agreement	.89	.91	.88	.91	.87	.86	.89	.91	.88	.91	.87	.86

Table 4a. Pretest and Posttest Percentage Distribution of Subjective Ratings of Quality, Originality and Organization of Stories Written by First-Grade Tryout and Comparison Classes in a Bilingual (Spanish-English) Lower-Income Inner-City District

	Tryout						Comparison					
	Pretest			Posttest			Pretest			Posttest		
Ratings	Quality	Originality	Organization	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization	Overall Quality	Originality	Organization
5 Excellent	0	0	0	0	0	0	0	0	0	0	0	0
4 Good	0	0	0	0	60	30	0	0	0	0	0	0
3 Fair	0	0	0	50	30	20	0	0	0	0	0	0
2 Somewhat Inadequate	0	0	0	50	10	30	0	0	0	0	0	0
1 Extremely Inadequate	10	0	0	0	0	20	0	0	0	0	0	0
0 No Response	90	100	100	0	0	0	100	100	100	100	100	100
number of Ss	10	10	10	10	10	10	10	10	10	10	10	10
coefficient of agreement	.89	.91	.88	.91	.87	.86	.89	.91	.88	.91	.87	.86

Table 5a. Pretest and Posttest Percentages of Types of Organization in Stories Written by First-Grade Tryout and Comparison Classes in Four School Districts

Type	District A*				District B				District C				District D			
	Tryout		Comparison		Tryout		Comparison		Tryout		Comparison		Tryout		Comparison	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Chronological	50	90	50	70	0	70	40	70	0	80	0	0	0	60	0	50
Spatial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plot	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0
Argument	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0
Other	30	10	40	20	30	30	50	30	0	20	0	0	10	40	30	50
None	10	0	10	0	70	0	10	0	100	0	100	100	90	0	60	0
number of Ss	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
coefficient	.92	.87	.92	.87	.92	.87	.92	.87	.92	.87	.92	.87	.92	.87	.92	.87

*A = white upper-middle-income suburban
B = white lower-middle-income suburban
C = bilingual (Spanish-English) lower-income inner-city
D = black lower-income inner-city

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Working Paper 9

FEASIBILITY OF USING ADULT TUTORS AND PARENTS TO ADMINISTER STRUCTURED SPEECH CORRECTION MATERIALS

Fred C. Niedermeyer

The purpose of this study was to investigate the feasibility of involving adult tutors and parents in administering structured speech therapy materials to children who lisp. This coordinated use of human resources offers promise in assisting school speech clinicians by providing effective individualized instruction that can be administered in a tutorial mode by paraprofessional aides in the schools and by the children's parent in the homes. The speech articulation program involved in the study thus comprised integrated personnel resources performing differentiated tasks structured by specially developed speech therapy materials.

PROGRAM MATERIALS

The instructional program was designed to correct the frontal /s/ lisp and other /s/ misarticulations of elementary school children. It represented an extension of the S-Pack Program system reported on by Ryan (1). Program materials included the following items:

Supervisor Materials. Procedures for the school clinician's use in initiating and supervising the articulation program (including the training of aides and parents) were contained in a program manual. The manual also included a scripted "evoking sequence" (which the clinician could use to elicit the proper /s/ response initially), a 36-item criterion test, and a 10-item transfer test.

Aide Materials. A programmed booklet was developed to be individually administered in the school by a trained aide in a series of 15 20-minute sessions. The booklet was designed to elicit over 1,000 /s/ responses in a variety of contexts (isolation; initial, medial and final word positions; sentences; stories; and games). Illustrations were used to cue the responses and scripted directions were provided for the aide (e.g., "This is the sun. Say sun."). Games at the end of each session were contingent upon the effort and attention of the child.

Parent Materials. Similar type programmed booklets were developed to be administered by the parent in the home following the child's completion of the aide materials in the school. The parent part of the program was designed to be administered in 15 15-minute sessions. Responses elicited in the parent-administered materials provided for extension or "carry over" of the child's /s/ articulation to less structured situations (e.g., making up and telling an original story about a series of given pictures rather than merely paraphrasing a given storyline).

PROCEDURES

The study was conducted during an eight week period in the fall of 1971. Twenty-six primary grade children, six school speech clinicians, seven adult paraprofessional aides, and fourteen parents participated in the study. The subjects were located in six schools in a large southern California metropolitan area. All but one of the schools were

located in lower-income neighborhoods. Clinicians selected the /s/ articulation-deficient children using screening procedures they normally employed. None of the 26 children had had previous /s/ therapy, and all of the children had normal dentition. Six of the children were in kindergarten, six were in first grade, ten were in second grade, and four were in third grade. Aides were paid approximately $3 per hour by the school districts. The aides, clinicians, and children represented a variety of ethnic backgrounds.

The clinician at each school first identified from three to six children who misarticulated /s/. To help determine the effectiveness of the parent-administered part of the program, one child at each school was randomly selected not to receive the parent materials and thus serve as a control for the remaining children who would receive both the aide and parent parts of the program.

Next each clinician selected and trained an aide according to procedures provided by the author. The selection criteria stated only that the aide have acceptable articulation and be able to read aloud the scripted materials. Training activities included (1) discriminating between correct and incorrect pronunciations of /s/, (2) reading and discussing the written procedures for administering the materials, (3) observing the clinician administer a program session to a child, and (4) role-playing certain sections of the program booklet with the clinician acting as the child.

Before each clinician began any instruction with the children, each child was administered the program's criterion test as a pretest.

(All testing was conducted by an individual trained by the author.) This 36-item test asked the child to use /s/ in all of the previously mentioned contexts (words, sentences, etc.). Next, each clinician worked individually with the children to evoke the proper /s/ pronunciation. Once a child could say /s/ properly ten consecutive times within 20 seconds, he was assigned to an aide. After the child had completed the three week programmed booklet with the aide, he was readministered the criterion test.

The clinicians then contacted the parents of the 20 children who had been selected to receive the parent materials and asked them to attend a one-hour meeting at the schools. The parents of 11 of these 20 children were trained in the schools using procedures similar to those provided for training aides. Three others were trained by one of the clinicians going to the homes. All 14 trained parents then administered the three week parent part of the program to their children. Parents of the remaining 12 children (six were not invited to use the parent materials and six were invited but were never trained) did not administer the parent materials during this time.

After three weeks all 27 children were then administered the criterion test again and were administered the transfer test (the first ten /s/ responses emitted were scored as child spoke freely about a given illustration). The test administrator had no knowledge of treatment groups.

RESULTS

Table 1 presents the articulation performance scores for the 14 children who received both the aide-administered program at school and the parent-administered program at home. Table 2 provides these data for the 12 children who received only the aide program and not the parent program. The parents of six of these latter 12 children were never asked to the parent program (Subjects 1, 5, 10, 15, 19, 23), and the parents of the remaining six were invited to use the parent program but did not (Subjects 6, 7, 11, 14, 18, 24).

As may be seen in Tables 1 and 2, the aide plus parent program children and the aide-only children averaged only 19 percent and eight percent, respectively, on the 36-item criterion test administered as a pretest. Following administration of the three week aide program at school, means of the two groups were 88 percent and 86 percent, respectively. After the administration of the three week parent program at home to the 14 aide plus parent program children, all 26 children were administered the criterion test a third time. As may be seen, the mean of the aide plus parent program children increased from a post-aide program mean of 88 percent to a post-parent program mean of 95 percent, while the corresponding mean of the aide-only children decreased from a 86 percent to 84 percent.

The mean score for the aide plus parent program children on the 10-item transfer test, administered at the end of the study, was 91 percent. The mean on this test for children not receiving the parent-administered program was 73 percent.

TABLE 1

/S/ PROGRAM TEST SCORES FOR THE 14 CHILDREN RECEIVING BOTH AIDE AND PARENT ADMINISTERED PROGRAMS

S's I.D. Number	36-Item Criterion Test Administered as Pretest	Criterion Test Administered as Posttest Following Aide Program	Criterion Test Repeated Following Parent Program	10-Item Transfer Test Following Parent Program
2	24	32	27	4
3	17	36	36	10
4	9	34	35	10
8	13	35	32	9
9	0	35	36	10
12	1	35	36	10
13	0	32	35	10
16	26	36	36	10
17	0	34	35	9
20	3	34	36	10
21	1	31	33	9
22	0	8	35	10
25	2	26	31	10
26	0	36	35	7
	$\bar{X}$ = 6.8 (19%)	31.7 (88%)	34.1 (95%)	9.1 (91%)

TABLE 2

/S/ PROGRAM TEST SCORES FOR THE 12 CHILDREN RECEIVING ONLY THE AIDE ADMINISTERED PROGRAM (NOT THE PARENT PROGRAM)

S's I.D. Number	36-Item Criterion Test Administered as Pretest	Criterion Test Administered as Posttest Following Aide Program	Criterion Test Repeated Following Parent Program	10-Item Transfer Test Following Parent Program
1	9	34	28	8
5	1	31	36	9
6	0	25	21	6
7	13	33	32	9
10	5	28	24	2
11	1	32	35	10
14	0	36	36	10
15	0	32	28	4
18	1	36	36	9
19	0	35	35	10
23	2	14	18	0
24	4	36	35	10
	$\bar{X}$ = 3.0 (8%)	31.0 (86%)	30.3 (84%)	7.3 (73%)

A meeting was held at the end of the study with five of the six clinicians and three of the seven aides attending. Four of the five clinicians present during the meeting indicated on a questionnaire that they definitely would use the /s/ program again, if available. The fifth clinician indicated she probably would use the aides again. Three of the five stated they definitely would use parents again, and the other two indicated they probably would use parents again.

End-of-study questionnaires were returned by 12 of 14 participating parents. From the questionnaire responses it was determined that eight of the twelve parents administered all 15 lessons of the three-week program. The remaining four responding parents indicated they administered only ten of the lessons, or about two-thirds of the program. When asked to indicate their child's overall reaction to the materials, seven of the 12 parents checked "very positive," three checked "somewhat positive," and two checked "somewhat negative." Thus 10 of the 12 (83 percent) indicated their child felt somewhat positive or very positive about the program.

DISCUSSION

The data from this study indicate that the /s/ speech articulation program, used under actual school conditions, substantially improved the /s/ articulation of primary grade children in less than two months (a total of about nine or ten hours of instruction). The posttest means of around 85 percent, following the aide-administered part of the program, replicate previous results with these types of materials with other phonemes (/th/, /r/), when the materials were administered by a credentialed clinician (2).

Children receiving the parent-administered program at home following the aide-administered program at school generally did better on the third administration of the criterion test (mean of 95 percent) and on the transfer test (mean of 91 percent), than did children receiving only the aide-administered program at school (corresponding means of 84 percent and 73 percent), although about half of the aide-only children did well on the post-program measures and may not have needed to receive the home program. In retrospect, more difficult-to-obtain measures of carry-over than the transfer test may have been more sensitive to differences between the two groups, e.g., unobtrusive measures of the child's spontaneous speech in the classroom or on the playground. End-of-tryout responses by aides and parents were generally favorable. Clinicians, too, reacted positively to the program and expressed a willingness to utilize it with aides and parents in the future.

The type of instructional system resulting from this developmental study has implications for school speech clinicians. A major problem confronting clinicians in schools today is the lack of time and resources necessary to effectively respond to all needs for articulation improvement among school children. Overburdened by expanding caseloads, the clinician is often forced to limit therapy to only those children identified as the most needy. Furthermore, with responsibility for sometimes two or three entire elementary schools, the clinician is unable to provide individualized attention and instead must work with children in less effective, small-group sessions. Finally, since

resources are scant, much of the clinician's valuable time is spent in the assimilation and preparation of materials to use in eliciting responses during the therapy sessions (games, pictures, stories, etc.). Thus, both the screening and therapy activities of the clinician ultimately suffer from these exhaustive demands on limited time and resources.

A partial solution to this problem, however, involves providing the clinician with new, but accessible sources of support, and with procedures for managing these resources. First, the clinician can involve available adult personnel in therapy interaction in school. Second, the clinician can make use of parents as a source for further therapy in the home. To utilize these new personnel resources successfully, certain materials and procedures are necessary: (1) procedures for recruiting and training paraprofessional and parents, (2) simple yet structured materials for these personnel to use with children in therapy, (3) assessment and record-keeping devices which allow for constant monitoring of the child's progress, and (4) clear, systematic procedures for the clinician to follow when managing both the human and materials resources. In addition, it is essential that these materials and procedures be research-based and tested in actual school situations to ensure their validity and workability.

Obviously, these procedures imply rather substantial changes in the responsibilities and activities of today's school clinician. The new clinician would spend less time working directly with the children, and would instead become more of a manager of the support system used

to extend individualized therapy to more children. Certain therapy tasks would, of course, still be carried out by the clinician. Tasks which would continue to require the highly-skilled clinician include screening and testing children, evoking the correct sound initially, and conducting some of the carry-over work. Aides and parents would use structured materials to extend the sound (once evoked by the clinician) to words (all positions), sentences, and semi-structured spontaneous speech. One clear advantage of such a differentiation of the therapy tasks is that the clinician would have more time to work on evocation and carry-over.

Once the tasks required for improving a child's articulation are differentiated, and various human and material resources utilized, the clinician's responsibilities may be outlined as follows:

- Identifies all children who misarticulate, using normal screening procedures.
- Administers a pretest on the misarticulated sound.
- Works with the child to evoke the sound in isolation.
- Recruits, selects, and trains paraprofessionals or adult volunteers to administer individual articulation therapy in school.
- Supervises administration of the modification materials by the trained aide(s).
- Readministers the pretest as a posttest and recycles the child on tasks still misarticulated until response is stabilized.
- Conducts parent training for administering articulation extension materials (carry-over) in the home.
- Administers a transfer test following completion of parent instruction at home.

With the assistance of trained aides and parents, a clinician can institute and supervise a speech articulation program which will greatly increase the number of children who can receive systematic, effective therapy.